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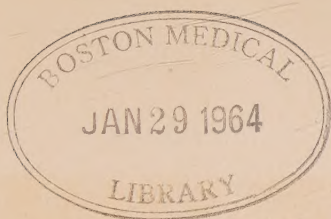


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A MANUAL  
OF  
PROCTOLOGY

BY  
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*SECOND EDITION, THOROUGHLY REVISED*

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## PREFACE TO THE SECOND EDITION.

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THE very gratifying reception which was accorded the first edition of this manual by the medical profession has necessitated the publication of a new edition. The author has availed himself of the opportunity to make a very careful revision of the entire text, has corrected some slight errors which crept into the first edition and has rewritten many sections to add clarity to some of the surgical procedures and to give more detailed descriptions of technic.

The literature on proctology which has appeared since the preparation of the first edition has been thoroughly studied, but no radical advances have been found with the exception of the noteworthy article by Dr. R. C. Coffey of Portland, Oregon, on "The Radical Operation for Cancer of the Rectum." This article, through the kind consent of Dr. Coffey, has been incorporated in the manual.

T. C. H.

BOSTON, 1926.





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# A MANUAL OF PROCTOLOGY.

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## CHAPTER I.

### METHODS OF EXAMINATION AND DIAGNOSIS.

THE great majority of general practitioners have been afforded opportunities for clinical instruction in nearly every department of medicine and surgery, with the notable exception of that large class of diseases common to the anus, rectum and pelvic colon. It is not remarkable, therefore, that many otherwise skilful practitioners imagine numerous difficulties associated with the diagnosis of these cases and, consequently, the treatment adopted by them is, as a rule, almost entirely perfunctory, haphazard and unsatisfactory. Even now there are physicians who accept the patient's self-diagnosis of "piles," ignoring the fact that the many different rectal affections are often all designated by this term by the laity, and without thought of the necessity of an examination to ascertain the real condition, give a prescription for an ointment or suppository. Vitally unfortunate results follow which could have been avoided by careful, painstaking examination. From personal experience I have come to the conclusion that most mistakes are due to the practitioner's failure to make a routine examination of his rectal patients rather than to his lack of knowledge.

**History.**—Rectal symptoms, as related by patients in the history of their own cases, frequently are very concise and to the point, while at other times they afford a very inade-



quate index to the correct diagnosis. Even when the story is more or less garbled with miscellaneous information about other complaints, the taking of a careful history enables one to get a general idea of his patient's nervous and mental make-up, his attitude toward his symptoms (whether he has a tendency to magnify or minimize them) and to determine if organic disturbances in other parts of the body may not have some bearing upon the rectal condition. Not infrequently, affections of the bladder, prostate, uterus, of the higher alimentary tract, of the appendix, etc., lead to reflex symptoms in the ano-rectal region.

**Symptoms.**—In every case coming to the proctologist, inquiry should be made into the action of the bowels—whether they are regular, the frequency of movements, their consistency, whether or not they are accompanied by straining, whether they seem to empty the bowel sufficiently or whether there is a sensation of partial retention of the feces; whether there is mucus, blood or pus; if there is pain, its character and time of occurrence. On account of the abundant nerve supply of the ano-rectal region, pain is a common symptom and may indicate any one of a number of conditions—abscess, hemorrhoids, prolapse, fistula, ulceration or cancer. Protrusion may mean a prolapse, papilla, polyp or other tumor. Hemorrhage, also, may be indicative of various conditions. Bright red blood at stool suggests hemorrhoids or ulceration. When dark in color and mixed with feces, a malignant growth of the bowel high up is brought to mind. In a like manner, it may suggest a stricture, benign tumor, polyp or a foreign body. Another common rectal symptom is itching, or *pruritus ani*, for which an underlying cause can often be found.

**Examination.**—The patient's own account of his symptoms will serve as a general index to his condition, but

care should be taken not to allow it to bias the mind. The proctologist should come to the physical examination open to all suggestions to which careful and thorough inspection, digital and instrumental examination may lead. So much information may be obtained from a carefully conducted examination that it is quite possible for a surgeon expert in the finesse of rectal exploration to describe with great accuracy the symptoms which are present in a given case, even without any history. For example, a patient who is suffering from an anal fissure applies for treatment. If, after separation of the buttocks, a linear ulcer is noted at the margin of the anus, and the external sphincter is hypertrophied and spasmodic, one is very safe in telling him that he is inclined to be constipated and when at stool suffers great pain, which lasts from one-half to two or three hours, after which he will be comparatively comfortable. On the other hand, if the ulcer is located higher in the anal canal over the internal sphincter, such a patient may be told that he has a smarting feeling at the moment of defecation and that in from ten minutes to a half hour there begins a dull ache which is possibly reflected over the sacrum and coccyx. Similarly, in cases of pruritus, hemorrhoids and in many other diseases of the rectum, one familiar with the symptoms can tell his patient very accurately how he feels. Thus, the importance of careful examination cannot be overestimated.

**Local Examination.**—For the local examination the usual office table or chair that allows the top to be raised or lowered and tilted from side to side is very convenient. If it is desired to make the examination at the patient's house, any table, such as is procurable in the ordinary household, will answer for a complete exploration of the rectum and sigmoid. The right or left lateral semiprone position is

the easiest in which to conduct the preliminary examination. When the buttocks are separated the whole perianal region comes readily into view (Figs. 1, 2 and 3).



FIG. 1.—Correct right lateral semiprone position.

**Inspection.**—The perianal skin should be inspected to ascertain whether its appearance is normal or abnormal. Among the external pathological conditions which can be



FIG. 2.—Incorrect right lateral semiprone position.

established by inspection alone may be mentioned ulceration, new-growths (benign and malignant), external and thrombotic hemorrhoids, eczema, the blanched and sodden appearance of the skin in pruritus ani and the external



openings of fistulæ, as well as post-anal dimples sometimes designated as pilonidal sinuses.



FIG. 3.—Elbow and knee position preferred by many proctologists. Patient can easily assume knee-chest position if sigmoidoscopic examination is found necessary.

**Palpation.**—Next, the region about the anus should be thoroughly palpated, noting, among other things, whether the external sphincter is in a state of tonic contraction or relaxed; also any point of tenderness that may be suggestive of the location of some lesion of the anal canal, such as concealed ulcer. Palpation will reveal the burrowings of a fistula and thus obviate the pain of exploring with probes. Frequently, indurations indicative of a deep-seated abscess can also be made out in this way.

Finally, before proceeding to the internal digital examination, the anal margin should be separated, at the same time requesting the patient to strain down. This measure will relax the sphincters, evert the anal orifice and bring into view such conditions as internal hemorrhoids and anal fissures,

**Digital Examination.**—Frequently, more efficacious than any instrumentation is examination with the index finger, covered by a thin rubber-tissue cot, thoroughly lubricated with vaseline, and gently inserted. Often more information is obtained by touch than by sight; for example, to the experienced examiner the “feel” of a growth means more than its gross appearance. It should always be borne in mind, however, that all manipulations whether digital or instrumental, should be conducted in as gentle a manner as possible. Introducing the finger roughly or hastily into the rectum without previous warning, or before requesting the patient to strain down, is responsible for much of the great dread that many persons have of rectal examinations. The lubricated finger is inserted with a rotary motion, the patient at the same time being requested to strain down as in the act of defecation. Only the first phalanx of the finger should be inserted to begin with, as many rectal diseases are located within an inch of the anal orifice. The resistance of both sphincters should now be observed and the internal opening of fistulæ, ulcerations, fissures, etc., can readily be detected at this level. The examination, however, should not be completed until the finger has been passed to its full extent in search of new-growths, strictures and invaginations, and the facilities for palpating the uterus, prostate and neighboring structures should be utilized as far as possible.

When the finger is being withdrawn the condition of the levator ani may be investigated by asking the patient to voluntarily contract the sphincters, and as they both receive their nerve supply from the fourth sacral they will, therefore, be contracted simultaneously. An exceptionally tight grip on the finger, with marked tenderness, should suggest a fissure, concealed ulcer or the incipient formation of a peri-

rectal abscess. One cannot, by mere digital examination, explore the rectum much above that portion which is uncovered with peritoneum, except anteriorly. However, large growths and fecal impactions of the sigmoid frequently descend, or can be depressed by bimanual examination, so that they can be felt through the rectal wall. As a rule, 3 or 4 inches is about as high as one can reach with the finger.

**Specula.**—The speculum is a useful instrument in connection with the non-operative treatment of internal hemorrhoids, removing hypertrophied anal papillæ (often the cause of rectal neurosis, pruritus, etc.), as well as for exploring the crypts of Morgagni for disease or foreign bodies, and in making applications to ulcers of the anal canal.

Most of the specula that are being offered for sale were made before the introduction of the proctoscope and were the only means of visual exploration of the rectum up to that time. Since then the round tubes of Kelly, and later modifications that have come into use, leave nothing to be desired for an examination of the rectum above the sphincters. The older conical bivalves, some fenestrated, others with wire blades or a removable one, can now be looked upon only as exquisite instruments of torture, except when employed under general anesthesia.

The speculum that I use, known as the Otis speculum (Fig. 4, *g*), is a round tube with an obturator, which is withdrawn after the instrument has been inserted. A section has been taken out of the distal end,  $\frac{1}{2}$ -inch wide and about  $1\frac{1}{2}$  inches in length. Its edges are smooth and the lower part of the tube supports the mucous membrane anterior to the part being examined, thus affording a good view.

**Retractors.**—The retractor is particularly serviceable for incising submucous abscesses and fistulas, and is an excel-

lent instrument to have at hand in case of a postoperative rectal hemorrhage. The one that I use is patterned after the Sims' vaginal, but made to conform with a greater nicety to the contour of the sphincters, the tip fitting snugly

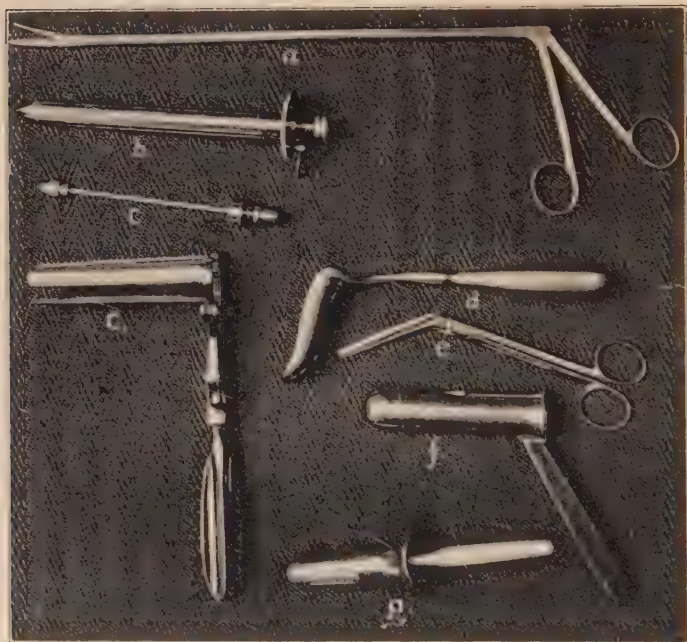


FIG. 4.—Special instruments I have found useful: *a*, alligator forceps, 14 inches long; *b*, long urethroscope for examination of children; *c*, operating speculum with obturator (opens widely by screwing the handle); *d*, Hill's retractor; *e*, nasal scissors for work through speculum; *f*, Hill's anoscope; *g*, Otis' speculum (I prefer it above all others).

into the hollow of the sacrum (Fig. 4, *d*). It can be inserted without causing pain by placing the palmar surface of the index finger in the concave surface of the blade.

**Abdominal Examination.**—Much useful information is often obtained by percussion and palpation of the abdo-

men, particularly in the class of patients with complaints of such a nature as to prompt one to make a sigmoidoscopic examination. The colon should be palpated throughout its entire course from the cecum to the rectum. Even when the patient may truthfully assert that the bowels are acting with seeming regularity, it is not an uncommon experience to find the sigmoid flexure and rectum overfilled with feces and the colon, above this point, much distended with feces or gas. The abdominal examination should include, as well, a search for any abnormalities, whether anatomical or pathological, not only of the colon, but also

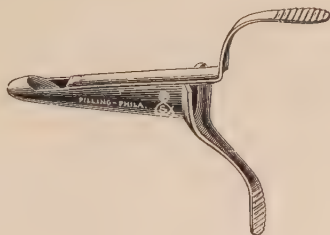


FIG. 5.—Brinkerhoff's speculum (three sizes).

of the liver, gall-bladder, stomach, spleen, pancreas, appendix and kidneys.

**Proctosigmoidoscopes.**—In order to examine and treat the upper rectum and sigmoid, the general practitioner can get along very well in the management of the great majority of cases with two Kelly tubes, one 6 and the other 10 inches in length. The Kelly instruments are intended to be illuminated by reflected light with a long-focussed head mirror.

When the longer instruments are used, the advantage of the electric sigmoidoscope over the head mirror and stationary light is considerable, and it was for this reason that the original Kelly instrument was modified by attaching a



small electric lamp at the distal end of the tube, which affords better illumination than is possible with reflected light. Another expedient feature of some of these electrically lighted proctoscopes was the closing of the proximal

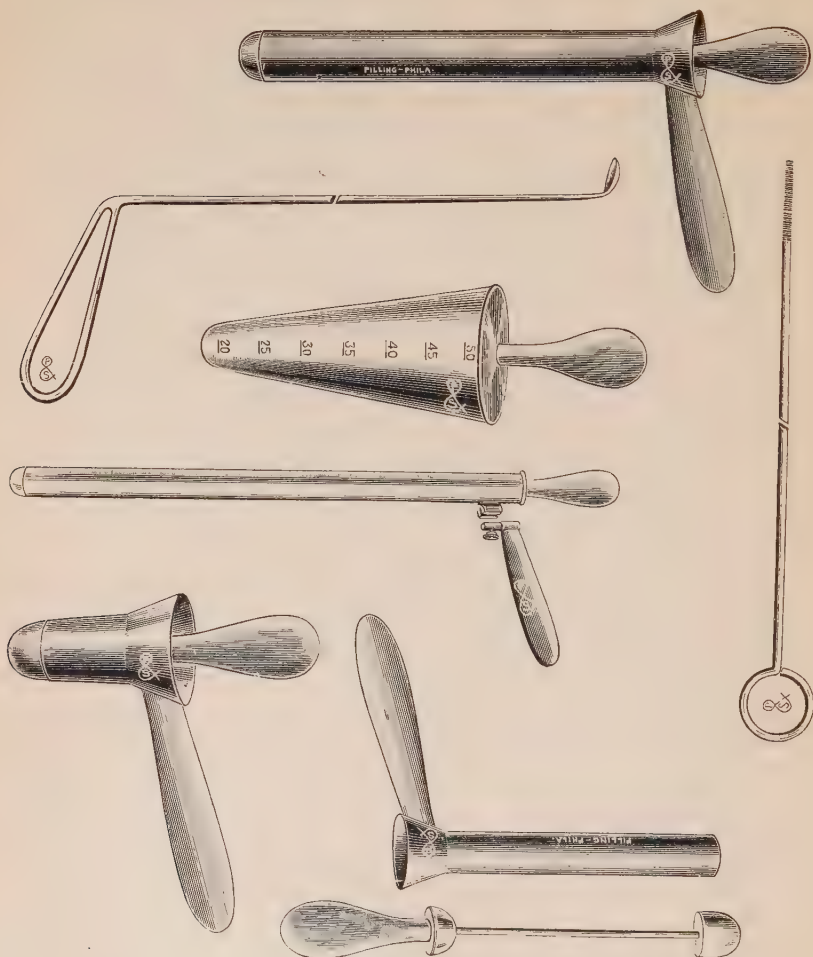


FIG. 6.—Kelly's proctoscopes.

end of the tube with a glass cap, so that the rectum can be inflated with air, forced in with a hand bulb.

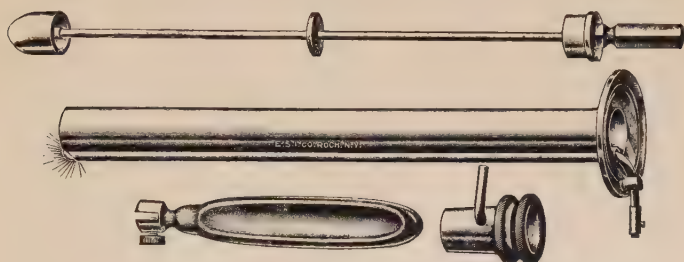


FIG. 7.—Tuttle's sigmoidoscope.

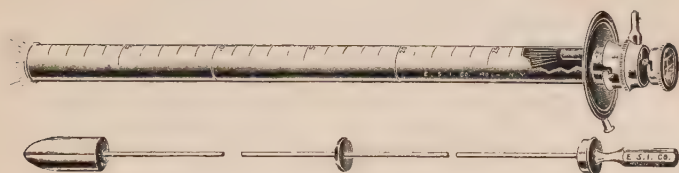


FIG. 8.—Lynch's pneumatic procto-sigmoidoscope, 10 inches.

**Preparation of the Patient for Sigmoidoscopy.**—The great majority of sigmoidoscopic examinations are conducted without the use of general anesthesia. Occasionally, however, it is desirable, when there are painful affections about the anus or the patient is apprehensive and neurotic. It should always be borne in mind when employing ether that, without the sensations of the patient as a warning, there is more danger of injury to the intestine by making too much pressure or distention.

All clothing tending to prevent abdominal relaxation should first be removed. When the rectum is found to contain feces, a small enema of boric-acid solution, not exceeding 8 ounces, will quickly empty not only the rectum,

but frequently the sigmoid as well, thus facilitating an adequate examination. In atonic conditions of the large intestine however, it will be found necessary to ask the patient to return later, so that he may be prepared for sigmoido-



FIG. 9.—Correct knee-chest position.

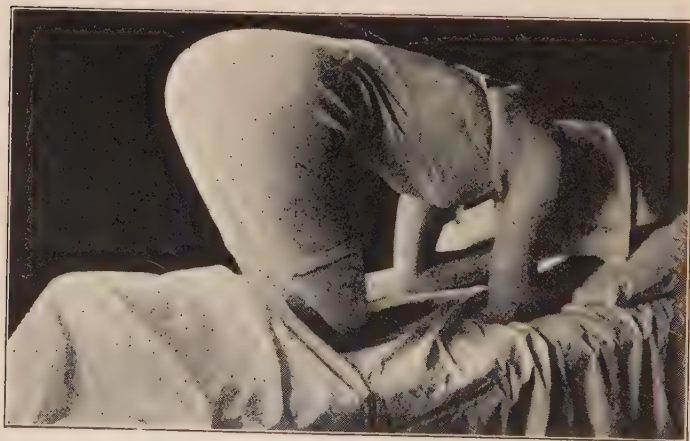


FIG. 10.—Incorrect knee-chest position.

scopy as follows: On the morning preceding the day set for examination, 3 to 6 drams of magnesium sulphate or a suitable dose of "Hunyadi" or some other aperient saline mineral water should be taken. Three hours before coming to the office the bowel should be further cleansed with a large enema of normal salt solution, to be followed two hours later by an injection of  $\frac{1}{2}$  pint of clear water containing 1 dram of glycerin. This last enema should never exceed the amount stipulated, for if more is used, some may remain in the sigmoid and cause much annoyance by being discharged during the examination or treatment.

Before introducing the sigmoidoscope the patient should be made as comfortable as possible in the genu-pectoral position. If, for some reason, this posture is impossible because of an ankylosed or amputated lower extremity, or great discomfort in assuming this position, the lateral semiprone (Fig. 1), with the knees well drawn up on the abdomen, may be substituted. In fact, this latter position is favored by some proctologists for esthetic reasons, because it is much less unpleasant for women and hypersensitive individuals. I believe, however, that, because of the greater ease with which the instrument is passed and the lessening of the degree of discomfort to the patient, the knee-chest position (Fig. 9) should, whenever possible, be given the preference.

The passage of any instrument into the rectum is rendered less difficult by first inserting the finger past the sphincters. This procedure dilates and lubricates the anal canal, as well as affords the surgeon an opportunity for ascertaining the exact direction in which the instrument should be guided before the obturator is withdrawn. The sigmoidoscope, warmed and smeared with vaseline, should be pressed firmly over the anal orifice, the patient at the same time being requested to strain down, thus relaxing the sphincters.

A steady, firm pressure in a downward forward direction should be made upon the handle of the instrument until it has passed the anal canal (Fig. 11). After this portion has been passed, the handle should first be gradually lowered and pushed forward until the end of the instrument has reached the middle portion of the sacrum (Fig. 12). At this point the obturator should be withdrawn, which will allow the bowel to become distended with air bringing into view

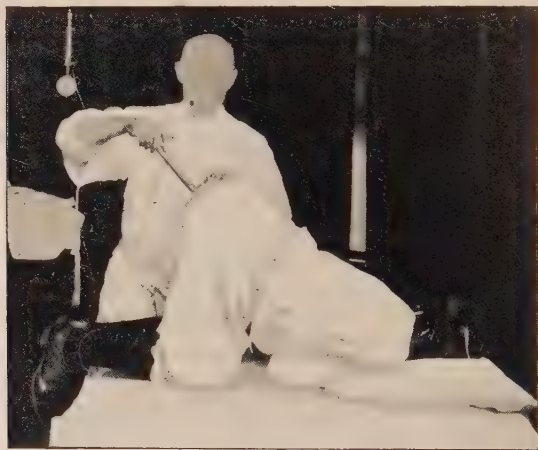


FIG. 11.—Downward and forward slant of sigmoidoscope, as it is passed through the sphincter area.

the free margins of the three or four valves of Houston. They are crescent-shaped, extend from one-half to two-thirds the way around the circumference of the rectum and project into its lumen from  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches. These valves are directed obliquely to the long axis of the bowel, are slightly cup-shaped, their concave surfaces upward. The valves and cavity of the rectum are carefully inspected as the tube is passed onward by sight. The instrument is then gradually





FIG. 12.—When the instrument has reached the middle portion of the sacrum, the obturator is withdrawn. Air now distends the gut so that one can readily see the direction in which the instrument should be passed.

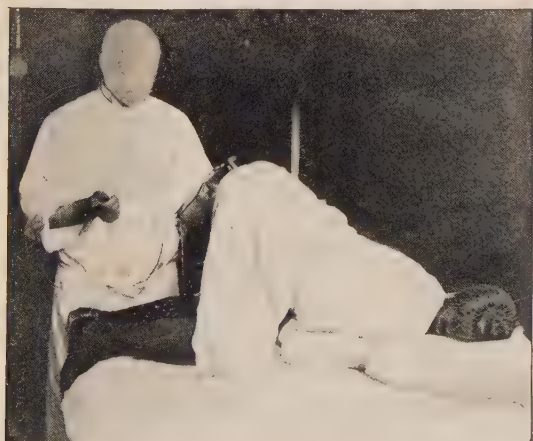


FIG. 13.—Sigmoidoscope has entered the sigmoid.

raised, which allows it to be gently pushed onward to the promontory of the sacrum, where considerable resistance to the onward progress of the instrument is met (Fig. 13). A great deal of difficulty is experienced by the beginner at this point in passing the instrument into the sigmoid, because of a well-developed fold of mucous membrane, known as O'Beirne's sphincter, situated at the junction of the rectum and sigmoid. This valve-like sphincter frequently makes

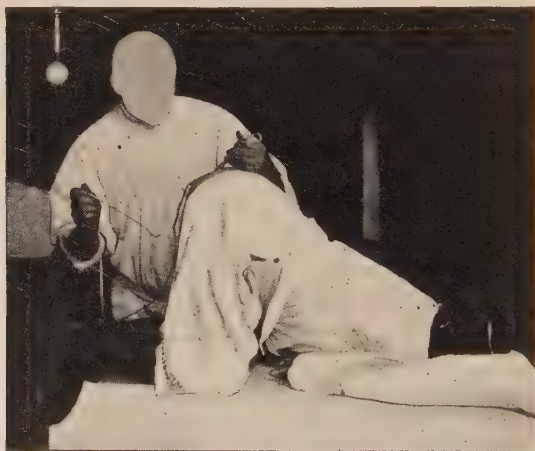


FIG. 14.—Making applications to sigmoid.

the rectum appear to end abruptly in a blind pocket. If careful search now be made, the valve will be located in close apposition to the opposite wall of the gut. It can then be effaced with the end of the instrument, so as not to retard its further progress into the sigmoid flexure (Fig. 14).

Caution must be exercised in passing the proctoscope, especially when there is an active ulcerative condition of the bowel. Several cases have been reported in which

perforation has taken place, in most instances caused by using undue force or overinflation of the gut with the pneumatic hand-bulb. By getting the patient in a good proctoscopic position, air insufflation is only occasionally required. Its danger lies in ulcerative conditions, for in some cases where there is an invagination, acute flexure, or angulation, air may pass on to the upper bowel without one's being aware of the fact and perforation result. If the onward progress of the instrument is impeded, it is better to withdraw it slightly, get the direction of the gut, and then reinsert the obturator, which will allow the tube to be passed with less inconvenience to the patient. This maneuver can be repeated until the tube has been passed as far as desired.

We have, therefore, in the proctosigmoidoscope an instrument which has been demonstrated to be of great practical utility, not only for the diagnosis of new-growths (benign and malignant), but also in the treatment of many conditions which are dependent upon catarrhal inflammations of the rectum and pelvic colon, such as hypertrophic and atrophic catarrh, traumatic, tuberculous and specific ulcerations, and so on. With the lesions brought plainly into view and easy of reach, direct topical applications to the diseased tissues may be made, which will prove more effective than the more commonly employed medicated enemata and suppositories.

## CHAPTER II.

### CATARRHAL DISEASES OF THE RECTUM AND COLON.

WHILE an intestinal catarrh may extend from the cecum to the anal orifice, it is more common to find it limited to some part of the large intestine, such as the rectum or sigmoid flexure, which can be accurately determined by proctoscopic examination. If the inflammation is limited to a portion of the intestine and is so situated as to render treatment per rectum feasible, it is obvious that an attempt should be made at exact diagnosis. Doubtless, in the majority of cases the whole of the large intestine is more or less involved in the inflammation, yet the more urgent and distressing symptoms are due to lesions of the more accessible regions, such as the rectum or sigmoid.

We designate, for convenience, a catarrhal inflammation of the rectum, rectitis; of the sigmoid, sigmoiditis; of the colon, colitis. Likewise, when two or more portions are similarly involved, they may be definitely referred to as recto-sigmoiditis (inflammation of the rectum and sigmoid), sigmoido-colitis (inflammation of the sigmoid and colon), and recto-sigmoido-colitis would indicate disease of the entire large intestine.

#### ACUTE RECTO-SIGMOIDO-COLITIS.

*(Including Rectitis, Sigmoiditis and Colitis.)*

**Etiology.**—Simple, acute inflammation of the large intestine of catarrhal form may have a common origin with

similar conditions in the mucous membrane of the other portions of the body. Some individuals appear particularly susceptible to reflex disturbances, and chilling of the body, especially the abdomen or buttocks, is sufficient to bring on an attack of acute inflammation. For others the irritating ingredients contained in cathartics, or in certain foods or drinks are all that are required. Parasites, foreign bodies and impacted feces, by producing slight wounds and abrasions, may cause bacterial infection of the mucous membrane. The bacteria which are always present in the large intestine are the colon bacillus, streptococcus and staphylococcus. Ordinarily they are non-pathogenic. Other bacteria which have been found in the lower bowel are the amoeba of dysentery, the cholera vibrio, bacillus of typhoid and of tuberculosis, the gonococcus and pneumococcus and anaërobic proteolytic bacteria.

In a catarrhal inflammation there is, first, a hyperemia and outpouring of serum, leukocytes and red cells. This extravascular exudate passes into the substances of the mucous membrane, causing it to become swollen and edematous. The mucin-forming function of the membrane is stopped temporarily, but afterward increased. Later, proliferation and desquamation of the epithelium take place. This desquamation may go on to such an extent as to cause small erosions which, becoming infected, give rise to ulcers. At this stage the mucus is increased and this, together with the increased leukocytes, gives rise to a mucopurulent discharge; or, when the leukocytes are very much increased, to a purulent one. Microscopically, the discharge shows pus cells, epithelium and a few red cells, together with the bacteria commonly found in the bowel.

**Symptoms.**—The most conspicuous symptom of acute catarrh of the large intestine is diarrhea, that is, frequent



stools that are abnormal in character. Concomitant symptoms are general prostration, loss of appetite, coated tongue and slight increase of temperature and pulse-rate. The symptoms vary somewhat, depending upon the portion of the bowel chiefly involved.

*Acute rectitis* is characterized by sensations of heat, weight and fulness in the rectum. There is also an aching, throbbing pain often radiating to the sacrum, down the limbs, or to adjacent organs, such as the bladder, evolving in the latter case a frequent desire to micturate.

Associated with these symptoms there is an almost constant desire to empty the rectum, with severe tenesmus and "colicky pains" in the left lower abdomen. In inflammation of this region the discharges are composed principally of an admixture of mucus, blood and pus. The amount of fecal matter is not notably increased, but is passed as scybalæ enveloped in the rectal secretions to which I have just alluded.

In *acute sigmoiditis*, with but little or no involvement of the rectum, the distressing tenesmus and constant straining at stool are not such marked symptoms. More relief is experienced after going to the toilet, and the diarrheal dejections show a considerable difference in regard to their minor characteristics. Their number is not nearly so many, varying from two or three to ten or more a day, while in the *acute stage of rectitis* the patient is constantly at the toilet. The consistency of the stools is more watery and not so scybalous. Mucus, blood or pus when evacuated is more apt to be mixed, or, at least, the color changed by contact with feces. There is usually, though not always, paroxysmal pain over the course of the flexure. The pain is referred more to the back and not to the sacrum and lower extremities as in rectitis. On palpation the sigmoid region is sensitive, and deep pressure produces considerable discomfort,

*Acute Colitis*.—Isolated catarrh is more common in the rectum and sigmoid than in the colon. It is probably only in rare instances that an acute colitis exists without the sigmoid and rectum being more or less involved. The subjective symptoms of colitis are so similar to those of sigmoiditis that it is scarcely practical to make any distinctions.

Physical examination will show areas sensitive to pressure over the lateral portions of the abdomen, corresponding to the course of the colon. This tenderness in some cases is even more marked over the hepatic and splenic flexures.

**Diagnosis.**—The rectum and sigmoid should be examined in all cases in which the symptoms indicate a severe type of inflammation. The whole of the rectum and the greater part of the sigmoid can be inspected, and the diagnosis, so far as these organs are concerned, easily determined.

Upon sigmoidoscopic examination, the mucosa appears red and swollen and, because of the close apposition of the mucous surfaces, there are numerous granular and congested areas. When the secretions are wiped away these spots bleed very readily, and they are frequently the site of superficial ulcers.

In ordinary cases the secretions observed consist of mucus, sometimes tinged with blood; but in the severer types the discharge becomes purulent, and infection of the solitary and agminated follicles is followed by numerous small, round, superficial ulcers.

**Treatment** —The majority of the milder cases, especially if the rectal symptoms are not pronounced, need only dietetic treatment and rest in bed. A liquid diet, composed principally of barley water and strained oatmeal gruel, together with beef, lamb and chicken broths is generally regarded as most suitable during the acute stage.

Unless there is an impaction of feces in the rectum or sigmoid, it is well to begin treatment with a large dose of castor oil. A thorough cleansing of the bowels acts favorably upon the existing diarrhea by removing any irritating ingesta or inspissated feces that may not up to this point have been expelled.

In all cases in which the symptoms lead one to suspect a more extreme grade of infection, or if the examination has revealed such a condition, local treatment should at once be commenced. This is important to relieve the more distressing symptoms of the patient, such as tenesmus and pain, and to prevent the acute condition from becoming chronic. Soon after, or even before the bowels have been emptied by a cathartic, non-irritating rectal irrigations should be begun. These can be given with a fountain syringe, using an ordinary rectal tip, the patient assuming a knee-chest posture during administration. The amount of fluid used should be from 1 to 2 quarts and should be allowed to run in slowly. If too much pressure is maintained by hanging the irrigator more than a foot or two above the level of the hips, the patient will be unable to retain sufficient fluid properly to cleanse the gut. I prefer for this purpose bland and non-irritating fluids, such as normal salt solution, bicarbonate of soda (1 dram to the pint) or boric acid (2 per cent).

In about two hours the solution will have been passed, leaving a clear field for instrumental inspection. At this examination the secretion adherent to isolated congested areas should be wiped away and followed by an application of an aqueous solution of nitrate of silver (30 grains to the ounce). If the condition be simply one of catarrhal inflammation, or if the eroded surfaces are widely distributed throughout the rectum and sigmoid, the whole of these cavities may be painted with a weaker solution (10 grains to

the ounce). Some prefer argyrol (10 per cent), ichthyol (15 per cent) in glycerin, or balsam of Peru (15 per cent) in castor oil. Powders such as aristol, boric acid, calomel or bismuth, applied directly or insufflated all over the rectal wall, are highly regarded by some surgeons. In my practice the solutions of silver and ichthyol have proved most serviceable.

The irrigations should be administered daily, preferably just after a movement of the bowels, and the local applications continued at intervals of three or four days until all localized lesions have disappeared.

When the catarrhal inflammation extends to the anal margin, as it frequently does, it has invaded particularly painful territory. The mucous membrane of this region is thin and friable and, consequently, congestion is soon followed by numerous fissure-like abrasions of the anal canal. The sphincters are in an irritable and spasmodic state and, the mucous membrane being swollen, it is often prolapsed by constant straining. At times, there is an almost intolerable tenesmus and I have seen cases of very extensive prolapse of mucous membrane and one case of procidentia occasioned by excessive straining, the sphincters at last becoming paralyzed. Such remedies as the injection of small quantities of laudanum and starch water, flaxseed tea, olive oil or the insertion of an opium and belladonna suppository will allay the painful tenesmus. A continuous irrigation with the Kemp rectal syringe, of either hot or cold water, depending upon the wishes of the patient, very often affords much relief. In extreme cases relief can only be given by dilating the sphincters under general anesthesia or placing the external sphincter completely at rest by dividing all its fibers under local anesthesia.

**CHRONIC RECTO-SIGMOIDO-COLITIS.**

*(Including Rectitis, Sigmoiditis and Colitis.)*

Chronic catarrhal inflammation of the large intestine is probably more common than is at the present time generally admitted. At least, it is fair to presume that, in a disease in which the less pronounced cases present such a variety of complex symptoms, errors of diagnosis are bound to occur.

**Etiology.**—Much that was said of the etiology of the acute form holds true in regard to the chronic condition. Chronic catarrh of any portion of the large intestine may result from failure to cure the acute inflammation. This may be due to the following causes:

1. A general systemic depression which leaves the mucous membrane in such a weakened condition that oversecretion takes place even after all lesions have healed.

2. Atrophy of the intracellular substance of the mucous membrane and obliteration of the mucous follicles, which interferes with the normal secreting and absorbing function of the large intestine.

3. Undue severity of the acute attack with complications, such as numerous erosions and superficial ulcers.

4. Too early cessation of treatment and indiscretions of diet which result in frequent relapses, each more stubborn than its predecessor.

5. Coexisting diseases, such as tuberculosis, syphilis, Bright's disease, diabetes, or other cachectic conditions, are sometimes responsible for an acute attack becoming chronic.

Chronic catarrh of the large intestine often gradually develops independently of an acute attack, as follows:



1. It may be secondary to disease of the small intestine, such as enteritis and typhoid fever.

2. Constipation, chronic impaction, parasites and foreign bodies are all known causes of chronic inflammation.

3. Polyps, multiple adenoma and papillomatous excrescences, by their chafing and secreting action upon the mucosa, are other exciting causes.

4. An intussusception of the colon or sigmoid, an invagination or prolapse of rectum by its mechanical action may bring about this condition.

5. I have on several occasions noted a decided narrowing of the caliber of the rectum at the site of the upper valve of Houston. The appearance through the rectoscope would lead one to infer that it is a congenital condition in which the valve is so placed as partially or almost completely to encircle the inner surface of the rectum. This condition should not be confounded with an annular stricture, or O'Beirne's sphincter, which it sometimes closely resembles. This, I believe, sometimes causes chronic recto-sigmoiditis; at least, it has been noted in a few intractable cases.

6. Among other mechanical causes should be mentioned adhesions, bands, appendicitis, movable kidneys and backward displacements of the uterus.

**Symptoms.**—With certain qualifications, much the same may be said of the symptoms of chronic catarrh which I have already noted in considering the acute type. The more urgent and distressing of the acute symptoms, such as tenesmus and severe pain about the lower end of the rectum, have given way to a feeling of weight and discomfort. In the chronic condition diarrhea is not the most pronounced symptom. In fact, in the typical case diarrhea usually alternates with constipation. The character of the evacuations is abnormal, yet they vary little from those described

in the acute form, and for this reason we must refer to what was stated in that connection.

In *hypertrophic catarrh* the secretions at times are abundant, and cause much annoyance by the irritation they produce about the anus. This discharge is frequently the cause of moist eczema and acute dermatitis of this region attended by pruritus. The discharge may be so profuse as to almost digest away the perianal skin, and, unless a protective dressing is worn, the patient is hardly able to get about. The calls to stool are frequent, and the usual feeling of relief after defecation is seldom experienced.

In the milder cases, in which the discharge is not so notably increased, there are unusual sensations from time to time. These are often vague and indefinite, and are characterized by the patient as either a slight tenesmus or as a feeling of heat and weight—"feeling as though there were more to come," or he is "always reminded, by an indescribable sensation, that he possesses a rectum."

In *chronic atrophic catarrh* constipation is always a marked symptom. It may, or may not, alternate with diarrhea. As a rule, it does not unless there are superficial ulcerations. The perianal skin is blanched and cracks easily. It has been my experience that aggravated cases of pruritus are much more common in this form of catarrhal disease than in the hypertrophic.

I have attempted to outline the symptoms only in a general way, as they have little weight in determining the correct diagnosis. In many of these cases they do not differ materially, whether the disease be a chronic inflammatory condition, mucous colitis, stricture or a new-growth. For example, constipation alternating with diarrhea occurs with almost equal frequency in all of the aforementioned diseases. Hemorrhage may occur in carcinoma of the rectum; at

the same time it may not, and it is often met with when there is no growth.

Indeed, there are few symptoms suggestive of disease of the large intestine that should not be investigated before undertaking any kind of treatment. It is not at all infrequent to find the ulcerative type of chronic catarrh, and even malignant disease, in patients whose subjective symptoms would never lead one to suspect any such condition. At the present time, serious errors of diagnosis are inexcusable, for with a local examination the nature of the disease can be definitely determined.

**Local Examination in Chronic Hypertrophic Recto-sigmoidocolitis.**—Upon introduction of the finger into the rectum, the walls of this cavity are found to be in close apposition. As a rule, fecal material is not present and the mucous membrane, well lubricated by the increased secretions, feels soft and boggy.

In this variety of catarrh we observe, on instrumental inspection, that the mucous membrane is of a pale red color, sometimes described as pinkish. There is much edema and swelling, associated with turgescence of the submucous cellular tissue, which limits the caliber of the intestine and renders it less amenable to the usual methods of air dilatation. A sigmoidoscopic examination is sometimes difficult to make on account of this congestion, which causes a prolapse of the folds of the mucous membrane over the end of the instrument.

As in hypertrophic catarrh of the nose or other mucous surfaces, the secretions are increased and consist, for the most part, of mucopus. Bleeding and ulceration are rare, though both may take place, especially in the follicular type. In this condition the Lieberkühn follicles appear red and swollen, and when ulceration supervenes they present

numerous small round ulcers, distributed in isolated groups. They are most commonly found in the rectum or sigmoid and, since, as a rule, they are not widely distributed, local treatment affords much relief.

**Chronic Atrophic Catarrh.**—Digital examination in cases of atrophic catarrh invariably reveals the presence of dry, hard, fecal material, unless the rectum has been previously emptied by cathartics or enemata. In the empty state digital exploration often gives one the impression of a cavity, so widely separated are the walls of the rectum. The rectal secretions are considerably diminished and the fecal mass often dry and hard. Both these circumstances are factors conducive to erosions and abrasions of the mucous membrane, which frequently terminate in a superficial or even deeper ulceration, depending upon the nature of the infecting bacteria. The mucous membrane can be made to bleed by simply wiping away the mucus, and small particles of clotted blood are often seen clinging to the rectal wall.

**Treatment.**—The treatment of these two forms of catarrh varies sufficiently to warrant their being considered separately.

It is in the *hypertrophic* variety almost exclusively that we frequently have to deal with mechanical problems, such as floating kidneys, displaced uteri, or adhesions binding down or constricting portions of the large intestine. The paramount difficulty is to determine the relative importance of these abdominal abnormalities and to decide whether they are really exciting causes. An exploratory incision has come to be regarded as a legitimate method of diagnosis, and is attended with little risk; still, I believe that, unless the cause is very obvious, it is seldom wise to advise any serious operation, or even the incision, before dietetic and local measures have been tried. A strict dietary regimen, which must be adapted to the special

requirements of each individual case, in conjunction with lavage of the bowel and local treatment will cure, or at least relieve, a good percentage of these catarrhal conditions.

*Treatment of Chronic Hypertrophic Recto-sigmoido-colitis.*

— *Diet.*—No hard and fast rules can be laid down as regards the diet. The peculiar susceptibilities of some people to certain articles of food must be given due consideration. A milk diet, especially when diluted with French vichy, is very beneficial in some cases, while in others it is very constipating, producing the hard “nanny-goat” stools, which by their traumatic action aggravate the catarrhal state. Nutritive gruels made from oatmeal, barley, rye or cornmeal, alternated with strained soups of lamb, beef or chicken, will prove more satisfactory in the latter class. This limited liquid diet is recommended for the first few days of treatment, as it is most essential to give the large intestine complete rest. It is even advisable, for the first week, to order absolute rest in bed in all but the mildest cases. The bowel is at rest only when free from fecal accumulations, and for this reason I order at the outset a full dose of castor oil. Another combination which may be used for the same purpose is sulphate of magnesia (2 ounces), dissolved in a tumbler of water. To this may be added a level teaspoonful of bicarbonate of soda; of this mixture, give a tablespoonful every half hour until free-water movements ensue.

As for the time that a restricted diet should be insisted upon, the patient should be told that it is absolutely necessary for a week or ten days in order to afford local treatment per rectum a fair prospect of cure. Gradually, a full diet, including such articles of food as chops, steaks, broiled fish and eggs, should be resumed. Vegetables rich in sugar and starch elements must be avoided. It is unnecessary to mention them here, for they are given very definitely in



numerous text-books. It is often advisable to increase the amount of fats. This may be accomplished with butter and cream, together with the use of olive oil. Oatmeal is a wholesome article of diet and is especially indicated in this condition.

*Local Treatment.*—The object to be attained in the treatment of this variety of catarrh is to free, and keep free, the large intestine of its accumulations of feces and putrefactive material for such time as is necessary to allow the mucosa to resume its normal condition and functions. For this purpose, we rely chiefly upon recto-colonic lavage and not so much upon topical applications as in the atrophic variety, for the inflammatory process is seldom confined to the rectum or sigmoid.

In the commencement of treatment, after the bowels have been freely moved with a cathartic, a large enema of normal saline solution should be administered. This may be given with the patient either in the knee-chest position, left lateral semiprone or on the back. When either of the two latter positions are employed, it is of material advantage to elevate the hips at least a foot. The irrigator is placed 18 inches above the level of the anus and the flow further regulated by pressure on the connecting tube when there is a desire to defecate before sufficient fluid has been administered. This uncomfortable feeling is due to the overdistention of the intestine at certain points when the onward flow is interrupted either by the normal sacculations or spasmodic contraction of the circular fibers. This sensation will soon pass away if the inflow is withheld for a moment, so as to permit the solution already within the gut to advance. Changing the patient from side to side and gently kneading the abdomen will facilitate its distribution. If these precautions are observed, the majority

of cases will retain sufficient solution to flush thoroughly the large intestine even as high as the cecum.

Among other available non-irritating solutions that are well adapted for use in the same way are boric acid (2 per cent) and bicarbonate of soda (1 dram to the pint). Later, solutions such as the following may sometimes be employed with much benefit: Argyrol, 0.2 per cent; nitrate of silver, 1 to 25,000; extract of hydrastis, 2 per cent solution; aqueous fluidextract of krameria, 5 per cent. These solutions are best administered hot, a temperature of 110° F. in the irrigator being most suitable. Irrigation is repeated at intervals of three or four days, depending upon the severity of the case.

At the end of two or three hours these enemata will have been passed, when much aid to the reparative process can be given by the instillation of 4 or 5 ounces of cotton-seed oil. The oil serves as a protective dressing as it is slowly carried upward by peristalsis.

When sigmoidoscopic examination reveals localized areas of acute hyperemia, erosions, superficial ulcers or inflammation about the mucous follicles, these lesions, though improved by the local treatment just described, are most often benefited by direct application of such stimulating agents as: Nitrate of silver, 2 to 10 per cent solution; ichthyol, 15 per cent in glycerin; balsam of Peru, 15 per cent in castor oil. When using nitrate of silver the weaker solution, not stronger than 2 per cent, should first be tried and later the strength may be gradually increased in accordance with the severity of the reaction it excites. These sigmoidoscopic applications are repeated not oftener than once in three or four days, preferably a few hours, after the colon has been flushed.

The palliative treatment of chronic invagination of the

sigmoid or upper rectum, at times associated with this form of catarrh, consists in replacement by air dilatation with the pneumatic sigmoidoscope, with the patient in the knee-chest position, together with the topical applications already suggested. Persistence in this line of treatment will sometimes effect a cure; but, should this palliative measure prove ineffectual and the invagination is well marked, operative treatment may become necessary.

Polyps, multiple adenoma and villous or papillary growths may often be removed, either with a ligature or with the galvanocautery applied through the sigmoidoscope.

In certain cases irrigation, topical application and dietetic measures do not improve the patient's condition. Then, even though these may seem indicated by the character of the lesions as viewed through the sigmoidoscope, they should be supplanted by other methods of treatment. The reason for their failure is that the mechanical causes before referred to are present and must be corrected before much amelioration of the symptoms can be expected.

*Treatment of Chronic Atrophic Recto-sigmoido-colitis.*—As in the other variety, the treatment is largely dietetic, in conjunction with local measures. As regards the diet for atrophic catarrh, it is similar in every respect to that usually advocated for habitual constipation.

*Local Treatment.*—The local treatment consists chiefly in keeping the rectum clear of feces and in stimulating the mucous membrane and whatever glands may not have been obliterated entirely during the process of atrophy. Since the disease is usually confined to the rectum and sigmoid, this is best effected by small enemas, not exceeding 8 or 10 ounces, taken immediately after the bowels have moved in the morning. This measure will cleanse the rectum and sigmoid of the dry accumulations of inspissated

feces and tenacious mucus that invariably are left behind in these atrophic catarrhs and which cause the feeling of incomplete relief after defecation. The agents I use for this purpose are normal saline and boric-acid solutions. When the mucus is very tenacious it can be more readily removed by an alkaline solution, such as:

R—Sodii bicarb.	}	. . . . .	āā	1 dram
Sodii biborat.				
Aquæ . . . . .				

These and the mildly antiseptic solutions enumerated for the hypertrophic variety may be interchanged as seems indicated. This part of the treatment should be carried out daily for a considerable time.

I have noted in many cases that great benefit follows the nightly injection of as large an amount of cotton-seed oil as can be easily retained throughout the night. The amount varies considerably, but by beginning with 1 ounce, it can be gradually increased to 5 or 6 in some individuals. The oil is a soothing, protective dressing, which both allays the irritation caused by retained feces and is of much value in procuring a soft, easy motion the next day.

If excoriations, ulceration or granular patches are seen during proctoscopy, they should be touched at intervals of four or five days with stimulating lotions of nitrate of silver (2 to 10 per cent), protargol (25 per cent), or insufflated directly with such powders as iodoform, calomel or aristol. Before applying either solutions or powders, the diseased area should be cleansed by wiping away any secretions that may be adherent.

## CHAPTER III.

### ULCERATION OF THE ANUS AND RECTUM.

**Etiology.**—Ulceration of the ano-rectal region fortunately makes up only a small percentage of rectal diseases, due to the fact that the blood supply here is so excellent that unless there is some other contributing cause these tissues withstand very well inroads from the ordinary pathogenic organisms. However, when there is an impediment to the venous return, which brings on a passive congestion of the rectum, injuries to the rectal mucosa are liable to be followed by ulceration. Diseases of the liver which produce obstruction of the portal circulation act in this way. In fact, sluggish circulation is responsible for the ordinary non-specific variety, the counterpart of which is seen in the common varicose ulcer of the leg.

**Classification.**—From a clinical point of view, most ulcerations of the rectum and ano-rectal region fall into certain definite groups with distinguishing peculiarities, according to the location in which they are situated. For this reason it is convenient to classify them in the order in which they are encountered during a rectal examination, that is, as: (a) Ulcerations of the external skin of this region; (b) ulcerations of the anal canal; (c) those which are chiefly located in the rectum proper.

### ULCERATIONS OF THE PERIANAL SKIN.

External lesions are very uncommon except those of a traumatic nature, caused by scratching and a form of con-



tagious or infective ulceration, much more common in women than men, due to uncleanliness and infection, more especially from vaginal discharges and to leakage of irritant fluids from the rectum owing to the presence of hemorrhoids.

A *primary tubercular ulcer*, though exceedingly rare, is occasionally met with in this locality. As a general proposition, however, when the ulcer is found to be tubercular the lungs should be thoroughly examined and more often than otherwise the primary focus will be found there. The most common type of tuberculous ulcers of the perianal skin are those of a secondary nature, and the majority of these are found in association with tuberculous fistulæ, the rapidly developing ulcer with its undermined edges being the external opening of the fistula.

*Secondary syphilitic manifestations* taking the form of ulceration are occasionally found on the perianal skin near the anus, though almost invariably the anal canal is involved as well.

*The primary chancre*, which I have encountered only four times, now and then extends out on to the skin, though the greater part of it is confined to the anal canal.

A superficial *epithelioma* or *rodent ulcer* developing in this region is also of rare occurrence. I have observed but one. In this case the ulcer was located on the right side, about a half inch from the anal orifice, and was about the size of a half dollar, with elevated edges of a bright red color.

The most common form of ulceration of the external skin is the *chancroidal* lesion, though here again the greater part of the ulceration is in the anal canal. These infections with Ducrey's bacillus are comparatively common among the class of female patients who frequent the outpatient departments of our large city hospitals. They are quite characteristic. The ulcers are large and extend an

inch or more up the anal canal; they spread rapidly, with the destruction of much tissue; there are usually three or four lesions, ragged in outline, with undermined edges, the bases of a deep red color or covered with unhealthy granulations and much necrotic material and they bleed very easily. The inguinal lymph glands are enlarged and sensitive and vary in size from small beaded nodules to large swellings, and may suppurate and require incision. There are no general symptoms or lesions in other organs of the body, as is the case in syphilitic infections, which aids in differential diagnosis.

### **ULCERATIONS OF THE ANAL CANAL.**

From what has just been said, it can be seen that many ulcerations of the anal canal have a tendency to extend outward on the skin, so that about the same type of ulcers as have just been described will be found within the anal canal.

**Symptoms.**—Ulcerated lesions which have not extended into the anal canal cause little discomfort, but when they have invaded this region they are particularly sensitive and painful, due to destruction of the nerve sheaths and exposure of the nerve filaments. The distress caused by bowel movements and the resulting contamination of the ulcer causes the muscles to become rigid and hypertrophied and the sphincters to contract spasmodically, thereby accentuating the pain, which is excited by defecation and lasts for a long time afterward. Bleeding, as a rule, is slight in amount. There is some discharge of pus, usually only a drop or two, but in the case of chaneroidal ulceration it is frequently quite profuse. Pain is the most characteristic symptom and, unlike that of the anal fissure which comes on after bowel

movements, it often appears just before a movement and then, with an interval of relief, starts up again soon afterward.

**Diagnosis.**—Diagnosis of ulceration of the anal canal is easily surmised on getting the history, though in this, as in every other rectal affection, the history alone can never be relied upon and a careful examination should be made. Because of the soreness, tenderness and spasm of the sphincters, unless the lesion is quite apparent externally, a thorough examination is sometimes difficult without the use of a general anesthetic. In the majority of cases, by the application of a swab of 20 per cent solution of cocaine followed in a few minutes by gentle manipulation, the anal orifice can be sufficiently everted to bring into view the ulcerated area and permit the nature of the lesion to be determined. If the sphincters are very tightly contracted, however, so that treatment is impossible without dilatation, a general anesthetic should be employed. A thorough dilatation of the sphincters will at once relieve the more painful and urgent symptoms and enable the surgeon to make the necessary applications on subsequent visits. If a single circumscribed ulcer well up the anal canal is discovered, a division of the external sphincter at a point which will incise the lower margin of the ulcer is the best form of treatment.

**Treatment.**—*Contagious, infective ulceration* found on the perianal skin clears up very quickly when absolute cleanliness is insisted upon. The parts should be bathed frequently—three or four times a day—during the acute stages, after which they should be protected by an anal pad on which has been dusted some antiseptic powder, such as compound stearate of zinc. If they are covered with unhealthy granulations and bleed readily, an application of nitrate of silver

(30 grains to the ounce), every three or four days will hasten the healing.

For the *primary tubercular ulcer* I have found that it is best to begin treatment by applying the actual cautery, after which the ulcer is dressed with a boric-acid ointment for the first few days. Later, as healing takes place, a dusting powder, such as thymol iodide, is very useful. Iodoform would perhaps be better, but because of its penetrating odor should be reserved for cases that do not yield to aristol.

In the more common type of *secondary tuberculous ulceration*, the treatment is generally influenced by the fact that fistulæ are associated with them. The fistulæ must be incised before any headway can be made with the ulcers. After having been opened, these wounds are treated the same as any other fistula and heal quite as rapidly. A local anesthetic should nearly always be employed, as general anesthesia is contraindicated because of the lung condition. In this country, particularly, it is advocated that these tuberculous fistulæ should always be incised with the cautery rather than the knife, the theory being that the bacillus is destroyed *in situ*, which is considered very important to insure rapid healing. My practice has always been to treat them as ordinary fistulæ, and the clinical results seem to justify this, the explanation being that cauterization destroys much normal tissue, and as a result a longer time is required for healing. Even though all the tuberculous bacilli are destroyed, there is nothing to prevent reinfection of the wound through the blood stream from the active process present in the lungs. Besides, there is a question whether all the bacilli are ever completely destroyed when the cautery is used.

The local treatment of *secondary syphilitic ulceration* is

not a very important topic. When they are discovered, the patient should have general treatment. About all that is required is cleanliness and applications of nitrate of silver to hasten the reparative process.

Probably the best treatment for a *rodent ulcer* would be complete excision, but when encountered in this locality it is often so large that it would be impossible to remove them completely without sacrificing so much skin that a painful contraction would take place. For this reason, some other method of treatment should be employed. In the case observed by me, radium was used with excellent results.

The local treatment which I have found most suitable for *chancroidal ulceration* of the anal canal and perianal skin is cauterization of the ulcers with pure phenol, followed ten seconds later with alcohol, after which the surface of the ulcer is dusted with calomel. The phenol applications are repeated at intervals of three or four days. Hot, moist compresses or a Sitz bath will relieve the distress and help keep the parts clean. In a great many of these cases it is advisable first to divulse the sphincters under general anesthesia. This will do much to alleviate the pain and tenesmus often associated with this type of ulceration and, at the same time, enable one more easily to treat the ulcers.

### ULCERATION OF THE RECTUM.

Ulcerations of the rectum above the level of the internal sphincter, in which the rectum alone is involved and not the sigmoid and colon, are not very common. The type of ulcers encountered here is a traumatic one, generally due to pressure necrosis caused by an overloaded rectum or, less frequently, to trauma of the rectal mucosa by a foreign



body. They are of such relatively uncommon occurrence, however, that when encountered a most careful examination should be made to ascertain whether they are the openings of submucous fistulæ. Many such ulcers are treated for a long time with little effect, for the simple reason that the true nature of the lesions was not determined. If a fistula extends from the ulcer, it naturally follows that if this is incised, the ulcer will promptly disappear.

The proctoscope reveals these ulcers clearly and determines the diagnosis. The simple traumatic ulcer usually occurs singly, is round or oval in contour, though sometimes irregular in outline, and varies in size from that of a ten-cent piece to that of a half-dollar. The edges are slightly everted and swollen, the swelling being largely due to edema. When uncomplicated by fistula they yield very readily to simple methods of treatment which will be outlined later.

In the pressure-necrosis type of ulcerative rectitis, due to retained feces, the whole rectum may have many diffuse ulcerated areas. These are superficial, the submucous structures not being extensively destroyed; the edges are not undermined, though the ulcer bleeds readily wherever it is touched with the cotton swab; the discharge is apt to be profuse, of a thin, watery, bloody nature. Other portions of the rectal mucosa may be undergoing various stages of repair by granulation.

*Gonorrheal infections of the rectum* proper are denied by some authors, though many cases are reported by others. At the Boston Dispensary we have examined many patients for the Neisser diplococcus, but have discovered it in only a small percentage of cases. That it does occur I am fully convinced, but the probabilities are that a gonorrhea infection degenerates very quickly into a mixed infection

because of the abundant organisms in the rectum. It is true, however, that gonorrheal ulceration of the anal canal is of much more frequent occurrence than is generally believed and that the rectal mucosa is not easily invaded.

*Syphilis of the Rectum.*—I have never as yet seen a primary chancre of the rectum, though some cases are reported. In those cases which I have seen the infection has taken place in the anal canal. Secondary syphilitic ulceration occurs more frequently, though it also is comparatively rare. At one time it was thought that this was the common cause of stricture of the rectum, but I think the preponderance of evidence now shows that stricture is more often due to trauma followed by non-specific ulceration.

*Tuberculous ulceration of the rectum* is almost invariably a terminal phase of generalized tuberculosis and not a primary condition.

These specific infections should always be taken into consideration, when ulceration of the rectum is observed through the proctoscope and the diagnosis arrived at by a process of exclusion aided by the usual laboratory methods.

**Treatment of Rectal Ulceration.**—The bowels should be regulated to secure free, soft evacuations without catharsis. After dejection a 2 per cent boric-acid enema, not exceeding 8 or 10 ounces, should be used, the object being to keep the parts as clean as possible. Local treatment of the ulceration can be carried out more easily here than when the disease is located in the anal canal, because it is more accessible through the proctoscope and applications are more easily made. One should be sure, however, that the disease has not extended beyond the rectum, as it will be of very little use to make applications to lesions here when a constant reinfection is taking place from a diseased sigmoid and colon. Sometimes the more urgent and distressing

symptoms, such as tenesmus and straining, are caused by the ulceration below, and to this extent alone is treatment of the rectum of any benefit. However, it is very frequently the case, especially in the type of ulceration due to pressure necrosis and trauma, that the rectum will be found to be the seat of all the ulceration present. Through the proctoscope, the ulcers are cleaned with a cotton swab, after which stimulating applications, such as nitrate of silver (2 to 10 per cent solution), are made directly to the ulcer. Here also one should always have in mind that submucous sinuses may be the cause of the ulceration and, if discovered, they should be incised. Calomel dusted directly on the ulcers, alternating with the nitrate of silver seems to work better in some cases. When the ulceration is very superficial but generalized, involving most of the rectal mucosa, very weak solutions of nitrate of silver (1 to 5000) injected into the rectum and allowed to remain for a short time are very useful. One should always start with a very weak solution and increase the strength with the degree of tolerance. Too strong a solution will cause a violent reaction with a good deal of tenesmus and straining, which should be avoided.

Diet in ulceration confined to the rectum is unimportant, though as a general rule, foods causing too much residue should be avoided.

## CHAPTER IV.

### ULCERATIVE COLITIS.

**History.**—Ulcerative colitis is known to have been in existence for over three hundred years, occurring during the earlier periods in an epidemic form which was called “bloody flux” or dysentery. Epidemics became progressively fewer during the eighteenth and nineteenth centuries (probably because of the better disposal of excreta), until they were found only in certain institutions, and at the present time, although the epidemic form is occasionally met with in asylums, the disease in northern climates manifests itself principally in the sporadic case.

**Etiology.**—This decrease in the number of cases occurring simultaneously—and even sporadically—has put the bacteriologist at a disadvantage in attempting to discover the infecting organism, so that even today its etiology is often obscure. Formerly, it was regarded as amoebic or bacillary dysentery, the infecting organism of which had been imported from tropical lands in contaminated fruit or water infected through the excreta of those who had lived there. Today we must consider not only this importation of organisms, but also the possibility of infection through the medium of carriers of both of these types of infection. Although the bacillary infection may not always result from the bacilli of the dysentery group, in the cases studied in this locality the infecting organism was found to be, in the vast majority of cases, the dysentery bacillus of Flexner and only very rare

that of Shiga. A few observers have reported the presence of a gas-forming bacillus. This is so frequently found associated with Flexner's bacillus that it may be considered either as a contaminating organism or as a secondary invader.

**Classification.**—While a more varied and elaborate classification of the different aspects under which the disease is met with is employed by many writers, it has seemed advisable in a book of this nature to divide all cases into either: (1) Acute ulcerative colitis, or (2) chronic ulcerative colitis.

### ACUTE ULCERATIVE COLITIS.

**Symptoms.**—The clinical picture of the acute form shows marked diarrhea of sudden onset, with mucus, blood and pus, severe griping pain at defecation and a great deal of tenesmus and straining. Accompanying the local symptoms are prostration, a dry, coated tongue, and in my own observations there has always been some rise of temperature, varying from  $1^{\circ}$  to  $3^{\circ}$ , though some writers claim that only in about 50 per cent is there any temperature, and this is in the more toxic cases alone. When the disease is more severe, there is great pallor, profuse perspiration, toxemia and the patient appears septic and very ill. In fact, there are occasional fatalities, though recovery from a single attack usually takes place in from three to six weeks.

In a small percentage of cases there are periodic recurrences, occurring especially in the summer time and lasting from a week to three or four weeks. These relapses increase in frequency and severity as time goes on, until they finally become more or less continuous, and the disease has then passed into the chronic stage.

**Examination.**—While frequently the patient is so prostrated that instrumental examination is unwise, if his con-



dition permits of the passing of the proctoscope, it will aid materially in determining the severity of the attack and the extent of the ulceration. In the milder cases the blood-vessels of the mucous membrane will be found to be intensely engorged and bathed with mucous secretions, but the deeper coats of the intestine are unaffected, so that the condition is little more than a rectal catarrh. In the severe cases, however, the deeper coats of the bowel are involved in the congestion; the mucous membrane is much thickened and, on touching the congested areas with a cotton swab, there is a ready effusion of blood and pus. The rectum and sigmoid are the most common site of the inflammatory process, though often the whole of the colon is involved, or rapidly becomes so.

**Treatment.**—A purgative should be administered immediately to rid the bowel of all accumulations and toxic substances. Some writers highly recommend the intestinal antiseptics, especially mercury in some form, but, as it is questionable whether their antiseptic properties are not lost before they reach the colon, and as the colon alone is involved, I believe the use of enemata to be more logical. I, therefore, advise at the outset:  $\frac{1}{2}$  ounce of castor oil or Epsom salts and, later, hot normal saline enemata once or twice a day. If there is a great deal of abdominal griping or tenesmus, deodorized tincture of opium (10 to 15 drops), two or three times a day, will help to allay these symptoms. Liquid foods, such as barley water or Horlick's malted milk, should be insisted upon for the first few days, after which a more nutritious diet may be carefully added. Orange or lime juice will offset the tendency to anemia.

Ordinarily, operative interference is quite unnecessary, though if the symptoms become grave, and especially if the colitis assumes the hemorrhagic type (as indicated by the

passage of dark, pitchy stools with a good deal of blood), an ileostomy, cecostomy or appendicostomy should be considered as the more toxic forms of acute colitis may render the wall of the colon so friable that perforation may occur.

### CHRONIC ULCERATIVE COLITIS.

In the chronic form of the diseases there is a history of a series of repeated attacks with apparent recovery, followed by relapses, and proctoscopic examination shows marked destruction of the tissues of the colon. In tropical amœbic dysentery only a small minority of the acute cases pass into the chronic stage although the patients may continue to be carriers though without subjective symptoms. When they do become chronic, however, it is often difficult to find the amœba in the succeeding relapses of the disease. May we not, then, draw the inference from this that the chronic disease is a secondary infection from the normal pathogenic bacteria in this region, to which the mucous membrane and submucous tissue have been made more susceptible because of the inflammation and amount of destruction that had previously taken place?

**Hemorrhagic Form.**—The severity of the disease and degree of toxemia vary with the extent of the ulceration. When the submucous tissue is extensively undermined, the gut becomes very friable, bleeding occurs and we have the hemorrhagic form, which is classified by some writers as a clinical entity. In certain cases, although the general infection may appear no more severe than in others, the colon seems to be more friable and spongy and the tendency to hemorrhage is greater. For a long time slight hemorrhage may be the only clinical sign of the affection and, on inspection, the mucous membrane of the rectum and

sigmoid may show only a spongy, pin-point granular appearance without definite ulcerated areas. In these cases the submucous tissue will be found to be markedly involved and frequently digital palpation will reveal thickening of the rectal wall. Because of this deeper infection, these hemorrhagic cases are the most serious and are more often followed by perforation, although, considering the severity of the ulceration, this complication is remarkably rare. One such case occurred in the writer's practice, a brief history and the autopsy report of which follows:

**CASE REPORT.**—In March, 1912, Dr. N., a physician, aged thirty-four years, well developed and nourished but rather anemic, came to see me and gave the following history:

For the past five weeks, during which period he had been attending his practice as usual, he had had symptoms of hemorrhagic colitis. For a great many years he had had at least one attack of diarrhea every year, at which times he passed some blood. These attacks cleared up under medical treatment with bismuth and salol. He had never been constipated, but, on the contrary, his bowels had always been inclined to be somewhat loose.

The present attack started with rumbling and gas pains which were soon followed by diarrheal movements, which had continued for five weeks. There were ten to twelve movements daily; not much tenesmus. Of late the bowel movements had interfered with sleep. He was taking 10 drops of deodorized tincture of opium every three hours, which afforded him some relief at night. The stools were liquid and contained much mucus, pus and blood.

*Rectal Examination.*—On digital examination, the mucous membrane of the rectum felt thickened and boggy, and brown mucopus escaped on withdrawal of the finger. On proctoscopic examination, the mucous membrane was red,

superficially ulcerated, of a spongy, granular appearance and bled very readily wherever touched with the swab.

Although the doctor felt that he was able to be about and to attend his professional duties, he appeared very anemic, and since the ulcerative condition of the bowel was so extensive I recommended absolute rest in bed. As he was under the care of his regular medical attendant, I saw him but twice later in consultation. Saline enemas were administered once daily, and he was put on a liquid diet, with codeine for the pain. He ran an evening temperature of  $101^{\circ}$  to  $102^{\circ}$ ; morning temperature normal or nearly so. The bloody, mucopurulent discharges continued and, although he seemed to be progressing fairly favorably, two weeks after I had first seen him he was suddenly seized with profuse hemorrhage and it was evident that he was rapidly sinking. He was removed to a private hospital that same night and a laparotomy performed to arrest the hemorrhage. Because of his condition and the extensive involvement of the colon, and since no single bleeding-point was found, all that was attempted was an ileostomy. He died the next morning. An autopsy was performed by Dr. William T. Councilman, the very interesting and complete report of which follows:

*"The Large Intestine and Lower 75 cm. of the Ileum.*—In the ileum, 30 cm. from the cecum, there is a perforation corresponding to the spot of enterostomy. The edges of the intestine here are necrotic, the serous surface thickened and covered with a firmly adherent fibrinous exudation. On the serous surface elsewhere there is a cloudiness and very slight deposit of fibrin. In the mucous membrane the solitary follicles are enlarged, not ulcerated, from 1 to 2 mm. in diameter. The Peyer's patches are slightly reticular. The surface of the ileocecal valve is free from ulcers.

Vermiform appendix has the usual relation. There is slight injection of the mucous surface of the proximal region. No other lesion. In the cecum there are large losses of substance, the surface clean, extending down to the muscular coat. The largest of these ulcers is 5 x 6 cm. in diameter. They are irregular, communicate with one another, and there is great undermining of the adjacent surface of the mucous membrane. There are, in addition, smaller irregular losses of substance separated from one another by bands which are undermined, the mucous membrane passing as a bridge in many cases between the two adjoining ulcers.

"At the beginning of the ascending colon the intestine is greatly dilated, measuring 18 cm. in circumference, the mucous membrane covered with smaller and with larger ulcers. There is but very little evidence of necrosis. The bases of the ulcers are usually perfectly clean. Everywhere is the extensive undermining of the edges. The mucous membrane between the ulcers appears somewhat swollen. The surface is perfectly clean, without any evidence of surface exudation. In the transverse colon the ulcers are more numerous and rather smaller, the most extensive large ulcers being in the ascending colon. At various places in the transverse colon there are large lines of ulcers, in these single small patches of mucous membrane being often perceptible. The peritoneum over the ulcerated areas is generally smooth. In the ascending colon, corresponding to an area of extensive hemorrhage and fibrin on the peritoneal surface, is a small opening about 2 mm. in diameter.

"*The stomach* shows a slight swelling of the mucous surface. The solitary follicles throughout the small intestine are very slightly enlarged and easily visible.

"*Histological Examination.*—The sections everywhere show the same general character of lesion. On the mucous sur-



face the glands are dilated, there seems an excess production of mucous, the epithelium is often desquamated and there is an exudation within the glands containing polynuclear cells and fragments. A few polynuclear cells are found in the interglandular tissue. There is no fibrin and the exudation is really slight in amount. In places there are sinuses without actual ulceration or with very slight loss of substance which extend down deeply into the submucosa. At the areas of ulceration there is very marked undermining. The ulcers are generally clean and at the base there is often an absence of evidence of active inflammation. At the bases they often present something of the character of a gastric ulcer. The submucosa in these areas is thickened; the connective tissue hyaline. The connective-tissue cells are increased, but in general the reaction can be characterized as slight. At the bases of the ulcers the vessels are sometimes partially thrombosed; they sometimes show necrosis of the intima and there is endothelial proliferation. There are a few bacilli groups, but in general they are small in number. The swelling of the endothelium of both veins and arteries is a marked feature. The bacilli are found especially in the sinuses and scattered in the bases of the ulcers. They are really less numerous than one ordinarily finds in intestinal ulceration. Much the same character of ulceration is found everywhere, and it is very similar to the amœbic.

*"The Peritoneum.*—The peritoneum over some of the deepest ulcers is swollen, but there is no actual exudation. A section of the intestines stained with Gram's stain shows that most of the bacilli in the sinuses are but feebly Gram-positive, the observer being, in fact, uncertain whether they should be regarded as really Gram-positive.

*"The condition appears to be a superficial one; appears to*

commence in the mucous glands, producing a dilatation and degeneration and exudation followed by softening, with extends into the submucosa. It is not accompanied by an active inflammation, but the liquefaction of tissue is very strongly suggestive of the amœbic infection. Sections of the lymph nodes of the mesocolon show a slight degree of edema but no marked alteration of any sort."

**Treatment.**—Many of the milder cases may be treated as ambulatory patients, but if the symptoms are pronounced, with a general "run-down" condition, associated with anemia and the passage of a good deal of blood, it is better that the patient be confined to the bed.

Colonic irrigation, either by rectum or by an artificial opening into the colon is the most effective method of treating ulcerative colitis. Irrigation from below is frequently all that is necessary and should have a thorough trial before operative interference is resorted to. Occasionally, patients are found to whom rectal enemata are intolerable, but this is seldom true if they are properly administered. A normal saline solution should be used in the beginning, as this is the least irritating; later permanganate of potash (1 to 4000), which will often entirely check the discharge of blood and pus and lessen the frequency of the bowel movements, or in some cases a 1 to 25,000 nitrate of silver solution may be employed. The irrigating apparatus should be placed not over a foot above the level of the patient's hips. This will allow the solution to run in slowly; if the rubber tubing is pinched and the flow of the fluid interrupted whenever the patient shows signs of feeling any discomfort, the solution already injected will thus be allowed slowly to distend the angulations of the intestine. Irrigations should be carried out daily for a time and gradually discontinued. After two or three weeks, the majority

of patients will be greatly improved and the more urgent symptoms will have disappeared, but for four or five months irrigation should be given at least once a week. Proctoscopic examinations, if made weekly, will allow one to note the results of the treatment and modify the strength of the solution, or make a change in medication if necessary.

**Operative Treatment.**—In the very severe cases associated with much hemorrhage, anemia and general debility, as well as those not improved by three months' local treatment, operation should be recommended. Ileostomy with complete diversion of the fecal current is the operation of choice for the more severe cases. For the less severe, a cecostomy or appendicostomy will suffice. There are certain advantages in using the appendix for this purpose; there is no escape of fecal contents, causing troublesome ulceration about the orifice; the patient is little inconvenienced and can carry out his own irrigation a few weeks after the opening has become established; unless there is a great deal of inflammation, the operation presents few difficulties. If, however, there has been a great deal of inflammation in the cecal region with resultant adhesions and strictures about the appendix, it may be impossible to employ this organ for this purpose.

*Appendicostomy.*—The appendix is reached through a gridiron incision, freed of all adhesions and brought outside the abdominal cavity. When this has been done, the incision of the peritoneum is closed by catgut sutures which include the base of the appendix. If evidences of inflammation have been found, it is best to open the appendix at the time of operation, as it might be found strictured and unsuitable for irrigation purposes, in which case a cecostomy would have to be performed. If there are no evidences of ulceration, the opening of the appendix may be left

until the next day. If it is decided to open the appendix immediately, after crushing to avoid hemorrhage, it should be packed around with moist gauze and amputated at a point about  $\frac{1}{4}$  inch from the skin margin. After amputation of the tip the proximal cut edge is treated with pure carbolic or the cautery and is next seized with fine forceps and held apart while a male urethral catheter No. 8 (or of sufficient size to be gripped tightly by the stump of the appendix) is passed into the cecum. The catheter is fastened in place by a threaded linen ligature, after which the skin incision is closed with interrupted sutures which also include the appendix.

If operation has been too long delayed and the patient is very toxic, there is little danger of infection in irrigating the colon at this time, before completing the dressings. In this case the catheter is connected with an irrigator and from 1 to 3 pints of a warm saline solution allowed to run slowly into the colon. In order that the fluid may pass out freely and to avoid overdistention (a very important point in these cases of ulceration), a small Kelly tube is passed into the rectum.

As a general rule, however, it is advisable to postpone irrigation for a day or two. Under these circumstances, as there is little sensation in the appendix, amputation and insertion of the catheter may be delayed for a few days.

During convalescence the colon should be irrigated from two to four times a day, with large quantities of normal saline solution. Later on the saline should be followed by permanganate of potash, 1 to 4000. The opening should be kept patent for at least six months after all symptoms have subsided. If there is a tendency for it to close it should be dilated by means of a catheter inserted night

and morning; if the tendency to close is very marked, the catheter or a small plug may be allowed to remain in overnight. The patient should be kept under close observation and frequent sigmoidoscopic examinations made to note the progress of the healing process. After the ulceration has been cured, the opening in the appendix may be allowed to close. As a rule, it closes of itself; if it does not, nothing more is required than to touch the orifice with the actual cautery.



## CHAPTER V.

### ANAL FISSURE.

FISSURE-IN-ANO is not a serious affection, although there are few rectal diseases which cause more pain and discomfort, or more insidiously undermine the general health of the patient, through irritation of the nervous system, than this apparently insignificant lesion. While readily amenable to treatment in its early stages, if allowed to run its course infection sets in at the site of the fissure, resulting in the development of a fistula. This process most frequently takes place in the posterior location and is responsible for many fistulæ in which there is no history of a previous abscess.

**Definition.**—Anal fissure, called by various writers “irritable ulcer,” “tolerable” and “intolerable ulcer” may be defined as a break in the continuity of the mucous membrane at the anal margin, commonly superficial, although occasionally exposing the muscular fibers, and occurring most frequently posteriorly or anteriorly. Usually, it is elliptical in shape, but on complete exposure of the parts, it may be found to be a circular ulcer of some breadth. At the lower border of the fissure will commonly be found a tag of edematous skin, often called a “sentinel pile” (Fig. 15). The fissure is almost always single and when more than one is found a syphilitic, gonorrheal or tuberculous origin may be suspected. The disease occurs in all periods of life, but is rare in the very young (here again it may be mistrusted to be of specific origin) and most

frequent in the aged. While Mummery, Adler and others claim it is more often found in males than females, Allingham and Tuttle find a greater number of cases among women. Out of 338 cases of mine, tabulated a few years ago, 163 were males and 175 females.



FIG. 15. Anal fissure with sentinel pile. This pile, either rudimentary or fully developed is encountered in the majority of fissures. At times it is absent.

**Etiology.** The primary cause of fissure is, without a doubt, constipation. By the forced passage of hard masses of fecal material, the mucous membrane, made more friable by irritation and congestion from the accumulation of feces, is torn. The inflammatory changes cause a blocking of the lymphatics at the lower end of the fissure and the

swollen and edematous skin tag known as a "sentinel pile" results.

Various theories of the anatomical causative factor in the etiology of fissure have been offered. Ball has advanced the idea that typical fissures are due to tearing of the crypts of Morgagni brought about by the lodgment of small fecal masses in these little pockets, which being pressed upon by hard stools, cause the valves at the edges of the crypts to

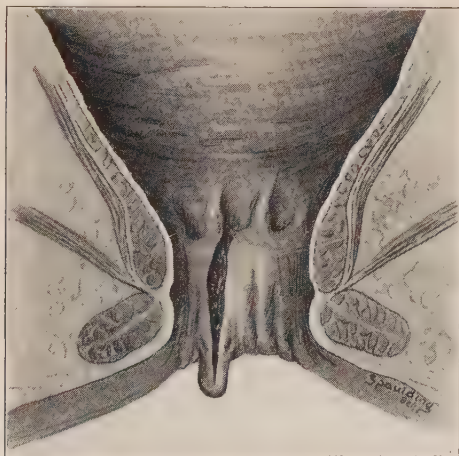


FIG. 16.—Fissure caused by laceration of one of the crypts of Morgagni.

tear; this rent is gradually extended by every subsequent passage until the whole depth of the crypt is torn through and the mucocutaneous tissue of the anus is thus involved (Tuttle). (Fig. 16.)

Lynch believes that the congenital absence of the perineum, or its rupture during childbirth, accounts for the anterior location of fissure in females. These patients are usually constipated and, owing to the lack of support ante-

riorly, the fecal matter which accumulates in the rectum bulges up into the vagina and requires a great deal of force to expel it. Owing to the congestion, lack of support and the effort to expel, the mucous membrane in the region of the anterior commissure is frequently traumatized.

I believe, however, in the majority of cases (Mummery supports the same theory) that fissure-in-ano can be very adequately accounted for by a consideration of the structure of the external sphincter. It will be seen that this is, in reality, a band of muscle fibers which, arising from the coccyx, divides, part of the fibers passing circularly around each side of the anus. Anteriorly, the fibers join and are almost continuous, but posteriorly they run parallel. Thus it will be seen that posteriorly the mucous membrane is not so well supported and that anything which tends to overstretch the sphincter puts a strain upon the mucous membrane at this point, so that it has a tendency to become torn apart in the direction in which the muscle fibers run. In like manner, the anterior commissure is a slightly less vulnerable point. Very seldom would the strain be sufficient to tear across the fibers; therefore, a lateral fissure is infrequent. Out of several hundred well-marked fissures which I have treated, I cannot now recall more than one or two instances of a lateral location, and as I look back on them from a longer experience with rectal disease, I think it very probable that these were not typical lesions, but recent tears which would have disappeared spontaneously.

Fissure may result from several causes other than constipation, *e. g.*, from a congenital narrowness of the anal orifice, from a hypertrophied condition of the sphincters, from rectal polypi, from herpes ani or from eczema. Anything which weakens the tissues and renders them liable to abrasion will act as a predisposing cause such as any wound—for example,

injury by syringe tips, or a tearing of the mucous membrane by the strain thrown upon it by a severe sneeze or cough and in women by parturition—or by excoriation or eruption, especially in syphilis, gonorrhea or tuberculosis, or by inflammation around the anus.

**Symptoms.**—The pain of anal fissure, as complained of by different patients, varies somewhat as regards character and severity, a fact that is often accounted for by the location of the lesion. A fissure at the anal margin causes a sharp, shooting, lancinating pain at the time of defecation, lasting, unless the ulcer is deep, but a few moments. Some of these superficial tears in the mucous membrane heal without treatment, and the individual may be free from pain for a few days or weeks; but if the bowels become constipated and hard masses are passed, the recently healed mucous membrane may again be lacerated. The proper treatment not having been instituted at this stage, the ulcer grows deeper and extends higher, when the pain is more often described as of a dull and dragging character, associated with the previously mentioned sharp and tearing sensation at the time of stool, and lasting for a variable time.

A fissure is still further aggravated by the patient's postponing defecation because of the pain excited. In this way the rectum becomes a storehouse for the feces, thereby setting up a proctitis and rendering the stool dry and hard by the absorption of the normal rectal mucus. The fissure is prevented from healing not only by the passages of this dry, hard fecal mass, but also by the hypertrophy, spasm and rigidity of the muscles, due to the overstretching and irritation of the sphincters.

If the stools of a patient suffering from a well-established anal fissure be examined, they will frequently be found



to be flattened and short, with a nipped-off appearance at the end, caused by the spasmodic contractures of the sphincters and levator ani during defecation. It is in this manner that what originally was but a slight abrasion at the anal orifice gradually becomes the characteristic triangular or oval-shaped ulcer which is known as an anal fissure.

When fully developed, and the muscle fibers of the external sphincter are exposed, the whole musculature of the pelvic outlet becomes rigid and spastic, so that the passage of the fecal mass excites an almost unbearable pain, lasting from half an hour to five or six hours after defecation. As a rule, the pain ceases suddenly, when the sufferer will be fairly comfortable until the next action of the bowels takes place.

Another ulcer frequently met with, but which is not visible at the anal orifice, is the round or circular one situated usually in the posterior line at the interval between the sphincters, or even above this level. The pain, when the ulcer is situated in this locality, is less acute and causes little distress at the moment of defecation, but in from ten minutes to half an hour there begins a dull ache which is often reflected over the sacrum and coccyx, with numbness extending down the back of the legs. Even symptoms simulating uterine and ovarian disease, as well as retention and painful urination, have all disappeared after the healing of this type of ulcer (Fig. 17).

**Diagnosis.**—However useful as an aid to diagnosis the symptomatology may be, it is often misleading, even as obtained from the most intelligent of patients after careful interrogation. Pain of some character at the time of defecation is the leading symptom, but it is quite essential to bear in mind that it may be produced by an abscess, thrombotic hemorrhoid, a foreign body, stricture, syphilitic

or gonorrheal ulcerations, or even malignant disease; therefore, the necessity of a careful physical examination.

In cases of anal fissure, the writer has no hesitancy in saying that a speculum should rarely, if ever, be used; yet, on the other hand, a most careful inspection alone is quite sufficient to make a diagnosis, but one should insist on a digital exploration, unless the parts are too sensitive,

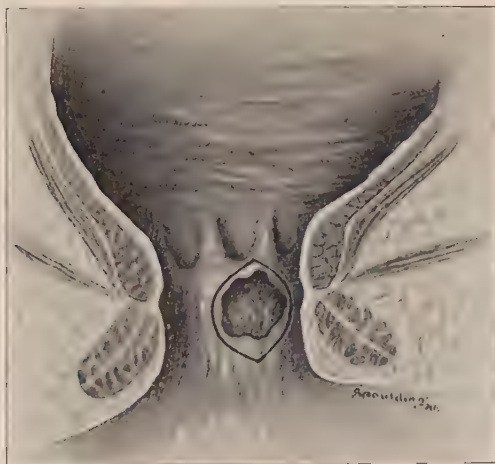


FIG. 17.—“Concealed” or round ulcer. This lesion should be excised as shown in the illustration, and the external sphincter divided at its lower angle as in the operation for fissure.

to ascertain whether such complications as internal hemorrhoids, submucous fistulae, polypoid growths, etc., exist. By gentle pressure with the tip of the index finger at different points over the whole of the external sphincter, any undue firmness or hypertrophy of this muscle may be detected, as well as a suggestion of the location of an invisible ulcer above the anus.

Having learned, if possible, the site of the lesion either by inspection or palpation, the finger should be introduced very gently, while making pressure directly opposite to the position of the fissure so as to avoid touching it, and a careful search, especially of the lower inch of the bowel, made for coexistent disease. The spasmodic contractures of the external and internal sphincters and even the levator ani can be felt, and a decision reached as to whether palliative or operative treatment would prove more satisfactory in the particular case under consideration.

**Palliative Treatment.**—In simple cases, usually of short duration, characterized by a shallow, red, linear tear, a palliative course of treatment should be tried and is very generally successful. If, after cocainizing such an ulcer, the sphincters are found pliable and dilate as readily as the normal anus, a cure without operative interference can safely be predicted. On the contrary, if the sphincters are not readily relaxed, it is best to adopt some other method or be guarded in one's prognosis.

In treating these simpler forms of fissure, it is advisable, at the first visit, to proceed with a moderate digital dilatation, which is usually easily accomplished if one proceeds slowly and with gentleness, employing the "massage cadence," as described by the old French writers. If there are any unhealthy granulations, they may be curetted lightly and touched with 10 per cent nitrate of silver.

If it is possible to do so, it is best to regulate the bowels by correction of dietary errors, aided by the nightly injection of cotton-seed oil. The oil softens or lubricates the outside of the stool and permits an easy passage through the anus. Many cases, however, require laxatives, and I have found cascara or compound liquorice powder and liquid petrolatum very satisfactory. There is nothing more irrita-

ting to a fissure than liquid stools, and for this reason active cathartics should be avoided altogether.

Next in importance to regulation of the bowels is cleanliness. The anus should be bathed night and morning with warm water and a sterile gauze dressing smeared with a simple ointment of 5 per cent boric acid, or, if the pain is unusually severe, cocaine or morphine ointment (gr. v to x to the ounce) may be applied to advantage.

The patient should be requested to call at intervals of four or five days, when the following local measures may be proceeded with.

After applying to the ulcer a 20 per cent solution of cocaine the sphincters are moderately stretched with the finger and an application of ichthyol (15 per cent) in glycerin or balsam of Peru (20 per cent) in castor oil applied upon a small pledget of cotton and allowed to remain for several hours. Nitrate of silver, either as the pure stick or solutions of various strength, has long been a favorite application in anal fissure and will occasionally produce rapid healing, but its routine use will often be disappointing. Tuttle recommends pure ichthyol applied to the fissure two or three times a week. My own preference is for the milder protective applications of ichthyol and balsam of Peru, as mentioned above, depending upon the gradual dilatation of the sphincters to effect a cure.

**Excision.**—This operation is applicable in a large percentage of cases not amenable to palliative treatment, and which do not require either dilatation or incision. The operation in itself is a trivial one and should be preceded by infiltration under and around the fissure with 0.5 per cent novocaine. A small fold of skin at the lower angle of the fissure, or the sentinel pile if one is present, may now be seized with a pair of tissue forceps and the ulcer excised well

up into the anal canal. A catgut suture may be inserted if thought necessary, but the contraction of the sphincters is generally sufficient to keep the wound closed. The more suitable cases for this operation are the more recent ones, where the ulcer is not too deep and where there is only a moderate degree of hypertrophy and spasm of the external sphincter.

**Dilatation.**—I cannot entirely agree with Lynch, of New York, who states, "Divulsion requires an anesthetic, increases the traumatism, causes extravasation, seldom gives permanent relief and should have no place in the treatment of fissure." Still, I can say that any surgeon who depends upon this method exclusively will have a definite percentage of failures to record. The advantages of this operation are its simplicity, that there is no cutting and but little after-treatment, and I have found it the method of choice in those cases where there is only a moderate degree of hypertrophy of the external sphincter, especially in children and elderly people.

The percentage of cures by this method is difficult to estimate, as all cases are relieved temporarily, though some recur later. But if the cases are carefully selected, I believe that this operation, simple as it is, will prove eminently satisfactory, and that the cure will be permanent.

The procedure is rarely satisfactory when employed with local anesthetics. Full surgical anesthesia is preferable so that plenty of time (five or six minutes) can be taken to stretch the muscle slowly. I have seen several instances of varying degrees of incontinence that were in all probability due to violent or excessive divulsion of the sphincters. It is much safer to use the index fingers than the thumbs for dilating purposes, as with the former one can better estimate the force exerted and is less liable to traumatize the anal musculature.



**Incision.**—This method has found almost universal favor among American proctologists and is practised exclusively at the special hospitals for rectal diseases, St. Mark's and Gordon's in London.

As first practised, it consisted of a single complete division of all the fibers of the external sphincter muscle through the base of the fissure. It is now considered better practice to divide the muscle just to the right or left of the posterior median line, without regard to the location of the ulcer. The object of the operation is to eliminate the spasmodic action of the sphincters and so give the fissure a chance to heal.

Incision can be performed under local anesthesia in the majority of cases, and the technic is as follows:

With a long, fine-pointed needle, begin the infiltration in the epidermis about  $1\frac{1}{2}$  inches from the anus. Slowly infiltrate about the fissure and sentinel pile, if one is present, to the depth of 1 inch at least. A sentinel pile, if present, or if not, the skin at the lower angle of the fissure is seized with a pair of artery forceps and the ulcer excised well up into the anal canal (Fig. 18). Then insert the finger in the anal orifice and feel the interval between the external and internal sphincters and press outward. This renders the external sphincter prominent, so that it can be divided with a scalpel. An assistant sponges the line of incision, so that the operator may be aware when the deepest fibers have been served. Any exuberant granulations or undermined mucous membrane adjacent to the fissure should now be removed (Fig. 19). Incisions should be made at right angles to the direction of the muscle fibers and carried outward for at least an inch to secure good drainage. It is important that the whole of the external muscle should be divided, and equally important to remember that one should be very



FIG. 18.—Excision of sentinel pile together with the whole of the fissure.



FIG. 19.—Wound left after excising the fissure and complete division of the external sphincter muscle. A light gauze wick is inserted in the wound.

careful not to injure the internal sphincter, as its division is invariably followed by some loss of control, if not absolute incontinence. If any polypoid growths are felt, they should be snipped off and the line of incision packed, as is customarily done after fistula operations.

**After-treatment.**—In the after-treatment it is necessary only to lightly pack the wound with sterile gauze impregnated with vaseline for two or three days. These small wounds, unlike those following fistula operations, are not infected and require very little after-treatment. After the first two or three days the patient can go about his affairs much as usual, but for a couple of weeks he should be seen at intervals of four or five days. At these visits the finger should be passed into the rectum to prevent adhesions of the wound during the healing process, and if any granulations are present they should be touched with 10 per cent nitrate of silver. The first movement of the bowels ordinarily will be much less painful than was the case before operation, even though one might think that because of the size of the wound it might be rather disturbing.

The results following this operation are always excellent, and any case of fissure, whether single or multiple, or whatever its location, can be cured and the cure will be permanent.

## CHAPTER VI.

### RECTAL ABSCESSSES.

**Definition.**—Abscesses of the perirectal region are classified according to their location and each variety will be described separately. The deeper and more serious ones have their origin in the superior pelvi-rectal spaces above the levator ani. This muscle forms the so-called pelvi-rectal diaphragm and envelops the rectum so completely that any abscess below this level never extends above it. The most common variety are those located below the levator, some of which are rather superficial; others are deeper, involving the ischio-rectal fossa. Unless incised early, those originating in this neighborhood either rupture externally or into the rectum, as a rule, between the two sphincters.

**Etiology.**—Like all other abscesses, they arise from direct introduction of bacteria. This may take place either through the skin of the perianal region, which is very rich in hair follicles and sebaceous glands, or through some lesion within the rectum, such as an ulcer, abrasion or fissure.

Pathologists tell us, and, indeed, it is a well-recognized fact, that infective bacteria are present in the superficial layers of the skin all over the body. Bacteriological examination of the anal skin in health shows many varieties of pus-producing organisms, and, as both within and without the rectum they are exceedingly numerous, it naturally follows that the perianal region is a favorite site for abscesses. The question of the most common infective agents, how-

ever, has never been settled, as bacteriological studies of the pus are beset with great difficulties and a pure culture of any organism is seldom found. The staphylococcus and streptococcus are commonly present; the bacillus coli is nearly always found, and is the cause of the very foul odor so frequently associated with abscesses in this region. Some infections take place through the blood stream—notably, those following injuries to the parts and those of a tuberculous type.

A primary tuberculous abscess is most uncommon, infection being more frequently secondary, gaining entrance through swallowed sputum, or from the pus of a tuberculous lesion of the intestinal tract. Even such infections must be comparatively rare, however, for I am informed that rectal abscesses are not especially numerous in tuberculosis hospitals. Nevertheless, the question whether abscesses and fistulæ are not, as a rule, tuberculous in origin is frequently asked. To my mind, this view of the etiology, so popular among the profession, has erroneously become the commonly accepted belief on account of the frequency with which such abscesses result in fistulæ through improper treatment.

**Symptoms.**—The symptoms of rectal abscess are analogous to those in other regions of the body, except that they are especially distressing because of the rich nerve supply to the lower end of the rectum. The pain is similar in character to that of other abscesses—a dull, throbbing ache, which comes on rather suddenly and gradually gets worse, becoming very severe in four or five days, until the abscess either ruptures or is incised. Often it is very intense because of the pressure of confined pus in a very sensitive area. There is also a septic temperature. On examination, induration, redness, swelling and, in the later stages, fluctuation may be noted.



**Treatment.**—The simplicity of the incision of an abscess as a surgical procedure, and the frequency with which abscesses in the perianal region are met, have led to minimizing the importance of their treatment. Except in relation to their location, it is true that they differ in no important particular from abscesses in other situations. Their location, however, makes the subject an important one for consideration; for every rectal abscess is a potential fistula.

The rapid burrowing of pus about the muscular structures which control the important function of defecation, if not recognized early and freely drained, may lead to serious results. Inadequate and poorly-devised incisions are responsible for much suffering and invariably terminate in rectal fistulæ, indeed, the invalidism and distress which follow the improper treatment of these cases can hardly be overstated. It is a common experience to see patients who have had abscesses and fistulæ incised regularly over a period of years without any benefit except a temporary relief of the painful symptoms.

The imperfect technic of incision is largely due to the fact that text-books on general surgery either give no information as to the type of incision indicated or, what is more to be regretted, their teachings as to the method of incision are impracticable and wide of the mark. Two of the very popular text-books cover the subject as follows:

"1. Early incision and drainage constitute the only treatment of this condition. . . . As the majority of these cases are caused by infection from the bowel, *in many instances a fistula results, requiring subsequent treatment.*

"2. The incision runs from the anal margin like the spokes of a wheel. Irrigate with salt solution, inject iodoform emulsion, insert drainage tube and *let the patient know he is in danger of developing a fistula.*"

This is all there is to be found about the treatment, of a practical nature, in either book.

Always to warn the patient that this condition may become a fistula, as these authors have suggested, is perhaps safest; on the other hand, I am firmly convinced that if the incisions are carried out as I shall presently describe them, this unhappy result will seldom, if ever, follow. It seems to me that every fistula should be regarded as a reflection on the surgeon's skill and, as these cases now make up nearly 50 per cent of all rectal affections, there is at present room for much improvement in their mode of treatment.

The following are some of the reasons for the frequency with which a fistula succeeds an abscess:

1. A very common error is to delay too long in opening the abscess, temporizing with fomentations, etc. The result of such delay is an increase in the size of the abscess with much destruction of the soft areolar tissue and consequent delay in the healing process. Pain and induration are sufficient evidence of abscess formation and one should never wait for fluctuation.

2. A small opening almost invariably results in a fistula. It should be remembered that, as the abscess cavity contracts, the incision is also shortened, thus affording poor drainage. The opening should be sufficiently large to remain patent during the after-treatment. It is a very painful procedure to push in gauze through a small incision as some surgeons do.

3. The form of incision is very important. The T or crucial is best for most abscesses. It will be recalled that even the skin covering the perianal region (*corrugator ani* muscle) has a tendency to close up the wound. When reinforced with the action of the external and internal sphincters,

it can readily be understood why an incision "running from the anal margin like the spokes of a wheel," as advocated, is so entirely inadequate in a rectal abscess.

There are several varieties of abscesses in this region and the method of operating varies with the particular form to be dealt with.

*Subcutaneous and Marginal Abscesses.*—Since the more superficial subcutaneous and marginal abscesses are small in size and show no tendency to burrow infiltration anesthesia is preferable. For this reason, a novocaine solution works well. The *subcutaneous abscess* can then be lifted with the thumb and finger and transfixed with a bistoury. A second incision should be made through the deepest part of the induration (crucial incision).

For the *marginal abscess* a T-incision is best, as there is less liability of injuring the external sphincter. To render the abscess more prominent the finger should be inserted into the rectum. The first incision is made parallel to the anus in the direction of the muscle fibers, the second from the first incision outward. The cavity should then be swabbed out and a moist, sterile wick inserted.

*Submucous Abscess.*—This abscess (Fig. 20) is usually found in the lower 3 inches of the rectum and lies just under the mucous membrane. It is smooth and elastic to the touch, much like a gum-boil, and is more or less elongated in contour. At defecation it causes acute pain and a feeling of weight and throbbing in the rectum. Apparently this abscess has its origin in the semilunar valves of Morgagni at the muco-cutaneous juncture, for it is at this level that it often ruptures during digital examination.

This variety, in some instances, especially when felt above the internal sphincter, closely resembles a pelvi-rectal abscess ((Fig. 23). It bulges into the rectal cavity

in much the same manner. I have encountered several such cases in which, even with the patient etherized, the type of abscess was doubtful. How can the two types be differentiated? I know of no absolute rule and have never seen any given. As I have just remarked, a submucous abscess can generally be made to burst by exerting force with the finger in the rectum. A pelvi-rectal abscess, being outside the muscular wall of the rectum, could not

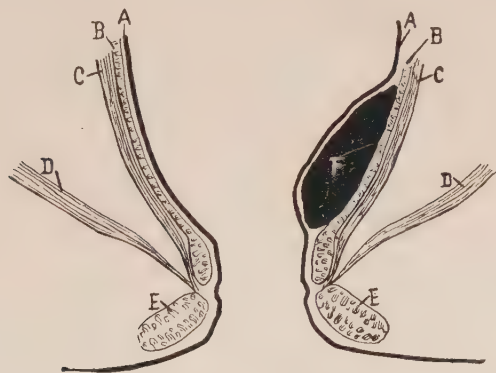


FIG. 20.—Submucous abscess. Ruptures into the rectum and sometime mistaken for pelvi-rectal abscess. *A*, mucous membrane; *B*, circular muscular fibers; *C*, longitudinal muscular fibers; *D*, levator ani; *E*, external sphincter; *F*, abscess covered by mucous membrane only.

easily be ruptured in this way. This has been the point of differentiation upon which I have chiefly relied. The puncturing of a pelvi-rectal abscess within the rectum would, of course, be a very grave error, resulting certainly in a type of fistula most difficult to cure, and very possibly leading to a septic peritonitis through a diffuse cellulitis of the pelvi-rectal space.

The treatment of the submucous abscess depends upon the stage of development in which it is discovered. If it

has already burst, or is ruptured during the first examination, the opening will be found at its lower margin near one of the crypts of Morgagni. It is not necessary to enlarge the opening, as this variety in over one-half of the cases will heal spontaneously within three or four weeks. If healing does not take place, the abscess should be laid open from end to end by a linear incision on a grooved director. If, after introducing the director, it is found by palpating the over-lying tissue that one of the branches of the superior hemorrhoidal artery will be severed, it is my practice to thread a linen ligature on a silver probe, which is passed through the sinus and tied tightly. The linen ligature will cut its way through the overlying mucous membrane in three or four days without any bleeding. When met with before the abscess has ruptured, a small T-incision should be made at its lowest extremity and enlarged with a pair of dressing forceps introduced into the abscess cavity and then opened as the instrument is withdrawn. No packing or other dressing is required. These cases should be kept under observation until soundly healed, for if allowed to become chronic, they frequently cause vague symptoms of discomfort in the rectum, often partially healing, leaving small sinuses which are exceedingly difficult to detect later on.

*Ischio-rectal Abscess.*—This abscess occurs in the soft adipose tissue of the ischio-rectal space, which is poorly nourished with bloodvessels (Fig. 21). A septic process here spreads rapidly, as a rule, and often this abscess attains in a short time a quite remarkable size. Frequently, what appears on examination to be a comparatively small abscess, at operation may be found to be a large one that will take several weeks to heal. The ischio-rectal abscess either breaks through into the rectum posteriorly, or often the pus finds its way back of the rectum to the ischio-rectal fossa



of the opposite side. It is this latter form which is responsible for the horse-shoe fistula. In some of these abscesses there is very little external evidence, but, on introducing the finger into the rectum, a good-sized globular swelling can be felt between the finger and the thumb on the outside.

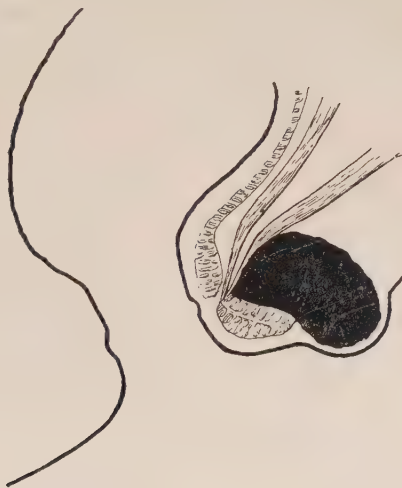


FIG. 21.—Ischio-rectal abscess. If not incised this abscess ruptures externally either on to the perianal region or internally between the sphincters into the anal canal. In the latter event a blind internal fistula results. In the former a blind external fistula.

Incision should be made under general anesthesia. Gas-oxygen is very satisfactory, as the operation can be quickly performed. The T-shaped incision is recommended. With the index finger of the left hand in the rectum, the exact limits of the abscess are determined. The knife is then passed into the cavity and the first incision made, which should be a free one, extending from one extremity of the induration to the other and parallel to the anal margin. A second incision is then made from the center of the first and

all pockets found gently broken down with the finger. Further incision because of lateral burrowing, unless very extensive, is unnecessary; in fact, it is better practice to avoid excessive mutilation, and the neighboring muscular structures should not be damaged at all.

*Pelvi-rectal Abscess.*—This deep abscess (Fig. 22) has its starting-point in the superior pelvi-rectal space, located between the levator ani, which practically surrounds the rectum, and the reflection of the peritoneum above. When

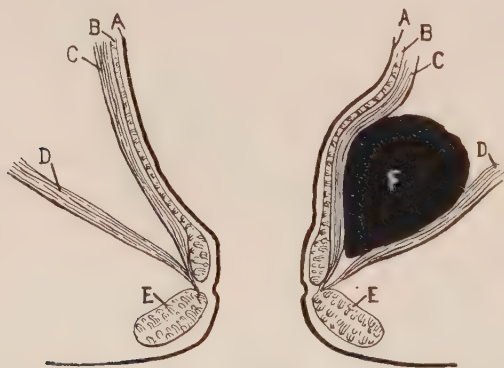


FIG. 22.—Pelvi-rectal abscess. Occupies the space above the levator ani, outside the rectal wall. A, mucous membrane; B, circular muscular fibers; D, levator ani; E, external sphincter; F, abscess.

originating here these abscesses may be caused by inflammatory conditions of the mesorectum, the broad ligaments in the female, or disease of the prostate, seminal vesicles and bladder in the male. They do not arise so often from lesions of the rectum itself, though they do follow ulceration and traumatic conditions, such as foreign bodies.

In its early stage, diagnosis of this form of abscess may be easily overlooked. In the more chronic cases the symptoms are not very pronounced, in many instances being

more of a reflex disturbance with pelvic distress and pain radiating to the lumbar and sacral regions or down the thighs. Digital examination, however, even in the earliest cases, will show a distinct fullness and swelling in the rectum. Later, the abscess follows one of three courses: (a) It invades the ischio-rectal space, at this stage rather closely resembling an ischio-rectal abscess (Fig. 23); (b) breaks through into the so-called retrorectal space; or, (c) opens

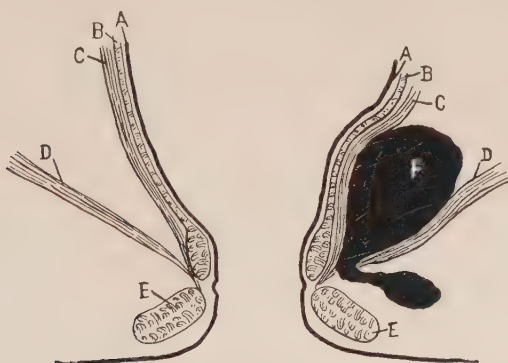


FIG. 23.—Pelvi-rectal abscess which has burrowed through the levator ani muscle into the ischio-rectal fossa. This form is often mistaken for ischio-rectal abscess. A, mucous membrane; B, circular muscular fibers; C, longitudinal muscular fibers; D, levator ani; E, external sphincter; F, abscess.

into the iliac fossa, following the line of least resistance and pushing the peritoneum before it. Therefore, the importance of always making a digital exploration to ascertain the starting-point of the suppuration.

When met with early (before the abscess has burrowed through to the ischio-rectal fossa), the incision is made as follows: A straight bistoury, with its back toward the rectum, the finger in the rectum to serve as a guide, is pushed upward into the abscess cavity until pus begins

to flow. The incision is then enlarged parallel to the anal canal and a careful dissection made down to the levator ani muscle. The incision should be enlarged until the muscle fibers and the opening just made into the superior pelvi-rectal space are plainly visible. The muscle fibers of the levator ani are now cut transversely on both sides so that the opening shall remain thoroughly patent until the cavity above has been completely obliterated. In these deep abscesses I consider this procedure of dividing the levator of the greatest importance, a method to which I first called attention in a paper read before the American Proctological Society, some twelve years ago. The method of enlarging the opening described in special works on proctology is its divulsion with the finger, or by means of a pair of dressing forceps passed into the cavity, then widely opened and withdrawn. This procedure simply separates the fibers and they unite before the abscess cavity above has been completely obliterated. This variety of abscess is the cause of the deep anterior horse-shoe fistula, the recto-urethral fistula, and sometimes the much more common posterior horse-shoe fistula, types that require extensive and often mutilating operations for relief. These unpleasant sequelæ can almost invariably be avoided by incising the levator muscle at the time of operation, as just described. The external wound should be converted into a T-incision as the last step in the operation.

Further explanation of the manner of dealing with this abscess when it has already involved the ischio-rectal fossa is unnecessary. Whenever incising what appears to be the ischio-rectal type, the possibility of this kind of an abscess should always be borne in mind. In all cases where unusual quantities of pus are evacuated, its origin will generally be found in the superior pelvi-rectal space. That the source of

the infection is often overlooked is evident from the many cases of deep-seated, troublesome fistulæ frequently encountered by all proctologists.

*Retrorectal Abscess.*—This abscess develops in the loose cellular tissue found between the rectum and the hollow of the sacrum, just above the levator ani. The pelvi-rectal form often invades this space, or the abscess may originate independently from necrosis of the sacrum, coccyx, ilium, or even the bodies of the vertebræ. In this latter event in which the bony structures are involved, it is very important that appropriate surgical measures be carried out; to eliminate this source of infection all dead bone should be removed, the cavity scraped, thoroughly dried and packed with gauze. After drainage is secured new bone forms and healing takes place in conjunction with the rectal abscess. Perforations of the rectal wall by sharp foreign bodies, such as a fish bone or a syringe tip, are said to be a cause.

The incision is made posterior to the anus and the fibers of the levator ani are divided in a manner similar to that described for the pelvi-rectal abscess. The finger is passed into the cavity and all pockets gently broken down. Tubes should always be employed for drainage purposes, and they should be removed as quickly as possible, as the wound granulates fast, as a rule. At the same time one should always ascertain whether there is any connection between the retrorectal and pelvi-rectal spaces. If such is found to be the case, tubes should be inserted so as to insure free drainage of this space as well.

*After-treatment.*—Having afforded ample drainage with good incisions, the after-dressings are simplified. There is no advantage in irrigating the abscess, as the pus will drain into the dressings. If gauze is put into the cavity, it should be used sparingly and changed frequently. The word



“pack” is responsible for much slow healing and many fistulæ. A drainage tube is far better for all deep abscesses.

I am a great believer in the hot sitz bath, night and morning, as carried out at St. Mark's, London. It is questionable whether boracic acid or other antiseptics added to the water are of any great value. The water should be boiled and used as hot as the patient can bear with comfort. In all the deeper abscesses the patient should be kept in bed or on a couch until healing is almost completed. As granulation proceeds, irregular healing should be prevented by sponging the surface of the wound with a small piece of cotton twisted on the end of a grooved director. This breaks down any bridging, and is an important detail in the prevention of fistula formation.

## CHAPTER VII.

### FISTULA.

**Definition.**—A fistula is a chronic, suppurating canal, the sequel of an imperfectly drained abscess, with one or more openings either upon the perianal region, into the rectum, or both externally and internally. It is a common rectal affection, more so in men than in women. Out of 303 private cases, I found 244 in males and 59 in females.

**Classification.**—A *complete* fistula has both an external and an internal opening, the sinus extending from the surface outside the anus into the rectal cavity. When the fistulous tract opens on one surface alone, it is known as an *incomplete* fistula. If this opening is outside the ano-rectal line, it is called *blind external*, and if within the rectum, *blind internal* fistula.

Of course, the simplest complete fistula is one having one external and one internal opening, with a straight tract connecting the two. It is very seldom that there is more than one internal opening. There may, however, be many external ones, five or six being not uncommon. In one case, observed by the writer a few years ago, the whole perianal region and buttocks were completely perforated with small openings—the so-called “watering-pot” fistula—yet there was only one connection with the bowel (Fig. 24).

Then, too, the connecting tract may assume all sorts of diviations, tortuous and winding sinuses. A common form is the horse-shoe fistula, in which the internal opening is

generally situated in the mid-line posteriorly and there is a tract passing forward on each side of the anus to external openings at the sides. The anterior horse-shoe fistula occurs less frequently, although it is not at all rare. Fistulae completely surrounding the anus are occasionally seen.



FIG. 24. — Watering-pot fistula. Photograph taken ten days after operation showing extensive incisions necessary to cure this fistula.

**Etiology.** — Almost without exception, all fistulae originate in abscesses. On rare occasions, however, they are met without history of a previous abscess. In these instances they are caused by pus-producing organisms which have gained entrance through abrasions of the mucous membrane. Not infrequently they are due to anal fissures. This latter variety develop slowly and, as a rule, are uncomplicated by extensive burrowing.

There are various ways of accounting for the failure of abscesses to heal and their degeneration into fistulæ. That a *complete* fistula does not heal is readily explained by the constant discharge of feces and gas through the fistulous tract, with consequent recurrent infection, preventing healthy granulation. In blind internal fistula there also is escape of fecal matter into the sinus and, because of the imperfect drainage, healing cannot take place. This does not, however, account for the non-healing of a blind external fistula. Here, the reason may be sought in the constant mobility of the parts with respiratory action, with action of the bowels, and with the movement of the sphincter muscles. Another factor is the tendency to stasis because of the lack of valves in the vessels near the rectum, and stasis is prejudicial to rapid granulation.

The question of the connection between tuberculosis and fistula is a somewhat disputed one. Tuttle says, "Modern observers have come to hold to the view that abscesses, ulceration and fistula of the rectum may be caused by direct inoculation of injuries and abrasions by the tubercle bacilli ingested with the food and carried through the intestinal tract." Mummery says, "It used to be taught that most fistulæ are tubercular in origin, but this is very far from being the case. At St. Mark's Hospital, London, the statistics clearly show that the proportion of tubercular fistulæ is between 10 and 12 per cent. These tubercular fistulæ may be primary, that is to say, there may be no other discoverable tubercular lesion in the patient. I have myself seen cases in which there seemed to be no doubt of the fistula being the primary lesion. Probably the primary tubercular infection occurs in consequence of the organisms getting through from the gut, owing to some abrasions; it is unlikely that it occurs from the outside,

It is found by bacteriological examination that the tubercle bacillus is present in normal feces. Of course, the reason why more people do not suffer from the tubercle is that they are able to resist it, not because they do not get the bacillus into their body."

**Symptoms.**—As a rule, there is very little pain, but an occasional dull ache or sense of discomfort; indeed, the pain is often of so little moment that patients are for years unconscious of the presence of a fistula. When it is a blind external one, there is very little discomfort as long as the opening is patent. When, however, this opening heals over, the chronic inflammatory process is again set up and extends further inward toward the rectum, until from the pressure exerted, the old opening is reopened or a new one made. During this process, there is considerable pain, which subsides after the abscess has again opened and drained.

The pain and discomfort of a complete fistula depend, in a large measure, upon the size of the internal opening and upon whether the feces are well formed or liquid. If the internal opening is a large one, allowing extravasation of feces and flatus, the fistula is kept in a continuous state of irritation, which produces the extensive burrowing and multiple external openings so frequently found. If, on the other hand, the opening is a small one, there is very little irritation except when the feces are liquid. It is, therefore, of importance when operation must be deferred that the patient avoid laxatives which produce liquid stools; in any event, the parts should be carefully protected with sterile pads from the discharges, to avoid setting up a chronic irritation of the perianal skin and the annoying itching so often associated with a fistula.



**Diagnosis.**—Inspection will reveal the external orifice of the sinus, which may be a mere slit in a fold of skin, or an irregularly shaped opening or ulceration of varying size. It may, on the other hand, be indicated by a tubercle-like projection, or a small cicatricial depression. Around the margin of the external aperture will be felt a dense fibrous deposit. By careful palpation this induration may be followed along the course of the tract.

A probe passed gently into the external opening will often pass directly through the internal opening of a complete fistula. If, however, it does not pass readily, the finger should be inserted into the rectum and the internal opening located by touch. This will be felt as an ulcer, elevated papilla or depressed cicatricial opening. With the finger over the internal opening, in the majority of instances the probe can then be gently pushed along until it meets the finger.

If there is no external opening and a blind internal fistula is suspected from the symptoms, an ulcer which may be the opening of the internal fistula must be sought for in the bowel and thoroughly explored with a probe for any sign of a sinus.

Allingham describes the position of an internal opening as usually just within the anus in the depression which exists between the external and internal sphincters, and says that this is true in 90 per cent of cases. Mummery, on the other hand, thinks this is not the commonest arrangement—that the internal opening is usually situated posteriorly, at the muco-cutaneous junction, but that the tract is superficial to the external sphincter. He considers that the great amount of inflammatory thickening at the anal margin accounts for the impression that the sphincter is superficial to the fistulous tract. That Mummery is correct

in his contention I am satisfied, as very frequently, even when the probe seems to pass rather deeply and one would be under the impression that he was dividing the external sphincter muscle, if the incision is made with a scalpel cutting down on the probe, it is found that no muscle fibers are divided.

Another method of locating the internal opening is by injection with a solution of methylene blue or some other colored liquid introduced into the external opening and injected into the tract. With a speculum the point in the rectum from which the fluid escapes may be seen.

**Non-operative Treatment.**—Although operation is the only treatment that really offers any hope of cure, many patients are so comparatively comfortable without operation, or are so apprehensive of its being followed by incontinence (which should never take place in properly conceived surgery), that they insist upon some other form of treatment. In a strictly palliative sense, about all we can do is to keep the external openings free by incision or dilatation and instruct the patient to apply hot fomentations occasionally. Hot sitz baths are quite effective, especially when the fistula is causing more or less pain. It is also very important, as previously mentioned, to keep the feces well formed, as liquid feces produce constant irritation.

Injections of bismuth paste have been recommended, but after a thorough trial, I have discarded this method, as I have never succeeded in curing more than the simplest type, which could have been more easily and quickly relieved by a simple incision under local anesthesia. Injections of strong solutions of nitrate of silver, a saturated solution as recommended by Goodsall, will cure some cases. The underlying principle of this method is the destruction of unhealthy granulations with the formation of new tissue

which gradually obliterates the sinus. Usually, however, these injections cause more pain than an operation, ordinarily several injections are required and the method is not without danger, although this strong solution seems to do very little harm to the rectal mucosa provided olive oil is injected into the rectum immediately afterward.

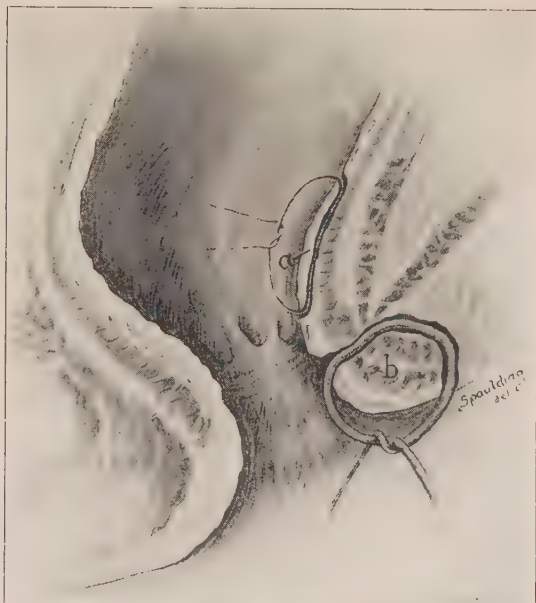


FIG. 25.—*a*, Linen ligature inserted through submucous fistula; *b*, rubber ligature applied to simple complete fistula.

*The Elastic Ligature.*—The elastic ligature is probably the safest and surest means of curing a fistula without operation, but this method also is applicable only to the straight, uncomplicated type. Its greatest drawback is the uncertainty as to whether or not there is lateral burrowing

from the main tract, for such burrowing, if present, will prevent a complete cure.

It is most effectively applied as follows: The ligature is introduced threaded on a flexible silver probe, or a specially designed director, which is passed from the external open-



FIG. 26.—*a*, Linen ligature tightly tied; *b*, rubber ligature tightened and shot; cuts through by necrosis.

ing into the rectum, and the rubber ligature attached to the point of the director inside the rectum and then pulled out through the external opening and fastened outside the anus with a small clamp or shot. In a week or ten days the ligature gradually cuts through the intervening tissue, as the fistula granulates up from below. While this method seems

to cause excruciating pain in some cases, other patients do not seem to mind it at all (Figs. 25 and 26).

In the submucous fistulæ which are always located above the sphincter area (Fig. 25 and 26), where there is little or no sensation, I use a strong linen ligature tied tightly as described on page 103. It cuts through much more quickly than the elastic ligature.

**Operative Treatment.**—There are three methods more or less in vogue in the operative treatment of fistulæ. These are incision, excision, and excision with immediate suture. Excision with immediate suture is, theoretically, the ideal operation, but except for the simplest type of straight fistula, it is a most uncertain method, as the wound almost invariably breaks down at some point, necessitating a secondary operation. If it were possible to excise and sterilize a large extensive fistula so as to close it with immediate suture and secure primary union, the time saved the patient would give this operation preëminence over any other. The practical impossibility of sterilizing an abscess cavity, however, makes this method impracticable.

Between incision and excision there is not much choice. Many surgeons always attempt to excise all the scar tissue whenever they operate upon a fistula. My preference is to incise all large fistulæ. If one removes all the scar tissue, a large gaping wound is left which heals by formation of new tissue of the same character, producing a good deal of deformity of the parts. Practical experience has convinced me that it is necessary to remove very little cicatricial tissue in order to cure a fistula, and ordinarily the period of convalescence is considerably shortened if the greater part of it is left.

At the present time, I believe the consensus of opinion among proctologists of wide experience is that the incision

method is the best for all types of fistulæ. Very rarely now will any surgeon advise excision with immediate suture; therefore, I will describe only the incision method.

There are certain general rules applicable to every type, which may be briefly summarized as follows:

1. The main tract should first be sought for and laid open throughout its whole extent.

2. All lateral burrowing should be fully incised, and the incision should be carried out on to the skin for a least  $\frac{1}{2}$  inch. These lateral offshoots end in a blind pocket, or cul-de-sac, and often give trouble in the future treatment if not adequately drained. It should be remembered (as mentioned under the operative treatment of abscesses) that what seems, at the time of operation, adequate drainage, is often insufficient, as the wound contracts during the healing process.

3. The probe-pointed director used in fistula operations should not have too small a point, and in its manipulation the greatest care should be exercised not to push the director into healthy tissue or to open up false passages.

4. The internal sphincter should rarely, if ever, be divided. In 95 per cent of cases, the internal opening is either superficial to the external sphincter or at the interval between the external and internal sphincters. Should a tract be found extending deeper alongside the rectum, as a rule it will not have any connection with the rectum. From such a sinus an incision should be made outward from its bottom to secure free drainage at its lowest extremity. If the opening does occur above the internal sphincter and provided that it is posterior to the rectum, it is my practice (although I am aware that there are many high authorities who do not believe in ever dividing the internal sphincter) to pass the director into the rectum and divide all intervening tissue,



which necessarily includes the sphincters, both external and internal. In my experience the wound heals rapidly and there is very little danger of incontinence. If the opening is anterior, this is a very dangerous practice, as the muscular arrangement is far different in this position; but fortunately fistulæ anterior to the transverse anal line are almost always superficial.

5. If there is any difficulty in passing the probe through the main tract from the external to the internal opening (as in operating upon the horse-shoe fistula), the lateral burrowing should first be incised, after which the director can be readily passed. In the division of the sphincter, the director should be so adjusted that the fibers of this muscle will be divided at right angles. A slanting division of this muscle causes irregular healing with wide separation of the ends, producing in consequence a certain amount of incontinence (Fig. 27).

6. The operation having been completed, all irregular angles of discolored skin should be excised, as they are not nourished by the blood supply and will only delay healing. Should there be any little islets of skin not undermined, they should be left as cicatrization will take place more rapidly, and in this way the time required for complete healing is diminished.

7. After division of the sphincter some adjacent mucous membrane not infrequently falls into the wound and causes much delay in the healing. At operation, if the mucous membrane is found to be very redundant, it should be excised well down to the depth of the wound. In the same way, internal hemorrhoids, even if small at the time of operation, after division of the external sphincter, are liable to become more prominent, as the anal orifice is somewhat relaxed. They should, therefore, be removed.

The rules here enumerated are applicable in nearly every fistula, and it is now only necessary to call attention to special features in connection with the various types.

For the majority of fistula operations the lithotomy position is the most suitable one. Unless it is a question of a simple straight fistula with a minimum of lateral bur-

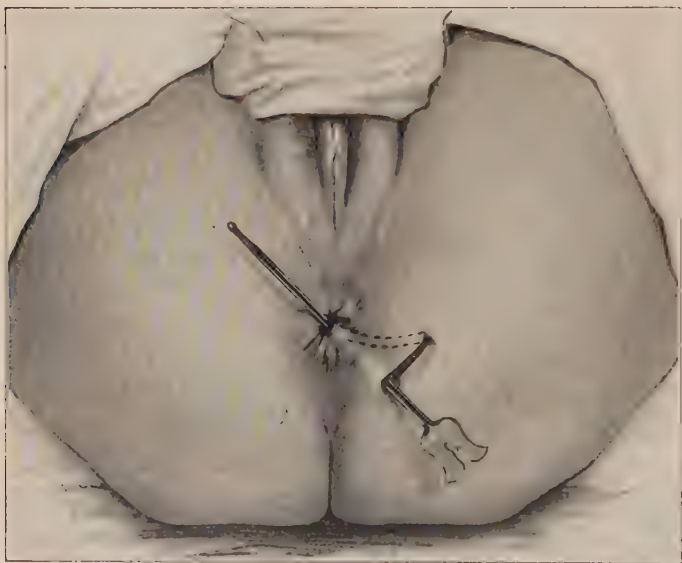


FIG. 27.—When the position of the external opening would necessitate an oblique division of the external sphincter muscle an incision is made so that the director can be adjusted so that the muscle is cut squarely across.

rowing, a general anesthetic should be employed, for, although there may be a great many cases that could be managed as well under local anesthesia, deep tracts are not readily palpable, and more often than otherwise what in an office examination has seemed a very simple affair will turn out to be rather complicated, so that sooner or

later even the most experienced proctologist is likely to regret it if his patient is not under full surgical anesthesia.

The preparation of the bowels should be carried out as advised in the chapter on Hemorrhoids. Care should be exercised to avoid any possibility of a movement of the bowels during or immediately following the operation, as any soiling of the wound before it has begun to granulate will be liable to reinfect the tissues.

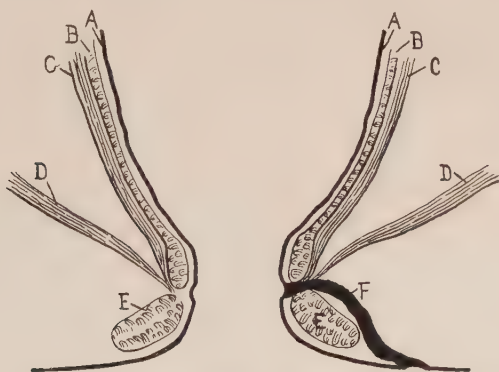


FIG. 28.—Simple straight complete fistula. A, mucous membrane; B, circular muscular fibers; C, longitudinal muscular fibers; D, levator ani; E, external sphincter; F, abscess covered by mucous membrane only.

*Simple Complete Fistula.*—As a guide to locating the internal openings of fistulæ, Mr. Goodsall, of St. Mark's Hospital, London, many years ago, formulated certain rules which have since been proven to hold true in over 95 per cent of cases. His dictum was that if an imaginary line bisecting the anus were drawn from right to left, a fistula with an external opening posterior to this line would always open into the rectum in the posterior median line; whereas, if the external opening were anterior to this transverse line, the probe would lead directly from the external

opening into the rectum. That is, if the external opening were in the posterior half of the perianal region and situated rather laterally, the fistulous tract would follow a *curving* course in order to open into the posterior median line. On the other hand, were the external opening in

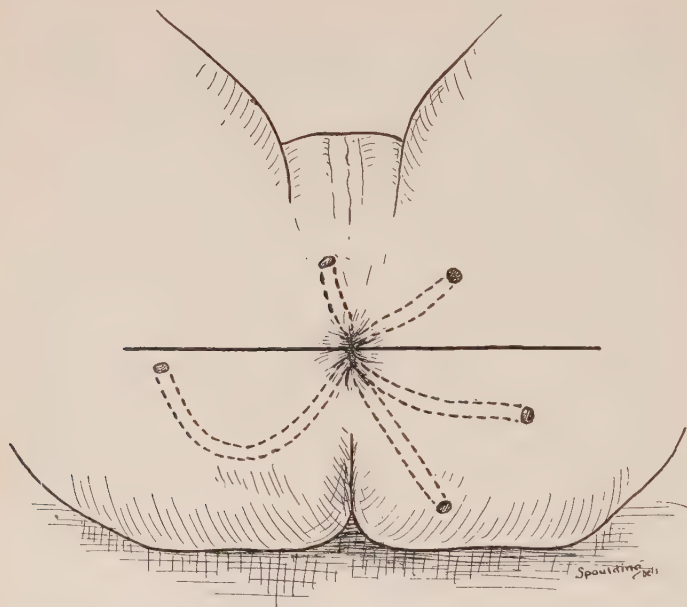


FIG. 29.—Illustrates probable location of the internal opening with reference to site of external opening. When the external opening is posterior to a transverse line which bisects the anal orifice the internal opening will be found in the posterior median line. When the external opening is anterior to this line the internal will be found directly opposite the external.

the anterior half of the perianal region, it would follow a *straight* course into the rectum, the internal opening being in a direct line with the external (Fig. 29).

Bearing these rules in mind, the index finger is passed into the rectum and the internal opening located. With

the finger over the internal opening, a probe-pointed director is inserted into the external opening and gently and gradually passed through the sinus into the rectum to meet the finger. The point of the probe is then brought outside the anus and the intervening tissue divided with a curved bistoury. Artery forceps are then attached to the skin at either side of the wound and as the assistant makes traction upon them the whole fistulous tract is thoroughly exposed. It is wiped free of blood with a gauze sponge and any large spurting vessels ligated. Should there be a good deal of oozing, this can be easily controlled by packing with gauze. Any lateral burrowing may now be sought out and incised, and any small dark spots in the fibrous tissue probed, as these are usually indicative of sinuses.

In order that no sinus may go undetected, some surgeons inject all fistulæ just before starting the operation with a solution of peroxide of hydrogen and methylene blue. Personally, I feel that this is unnecessary. When the wound is retracted and the operation performed under a good light, sufficient time being taken to trace out all suspicious areas, no sinuses will be overlooked. I usually make a few incisions in the fibrous tissue but do not attempt to excise it.

*Posterior Horse-shoe Fistula.*—In this type there must, of course, be two external and at least one internal opening, though, as a rule, there are several external ones. As the original opening indicates the main tract, and should be the point from which the operation is started, it is a great help if this point can be previously ascertained from the patient.

If the director is slightly curved, it is easily passed from the external opening into the bowel, thus isolating the main tract. There are two methods of proceeding in this type of fistula, depending upon the size of the internal opening. If this is small, a two-stage operation is preferable. That

is, the whole fistula, together with the lateral burrowing, is thoroughly laid open so as to afford the freest drainage, and the opening into the bowel is left for a secondary operation. The advantage of not opening into the rectum at the time of the original operation is that healing takes place much more rapidly, as the wound is not soiled with

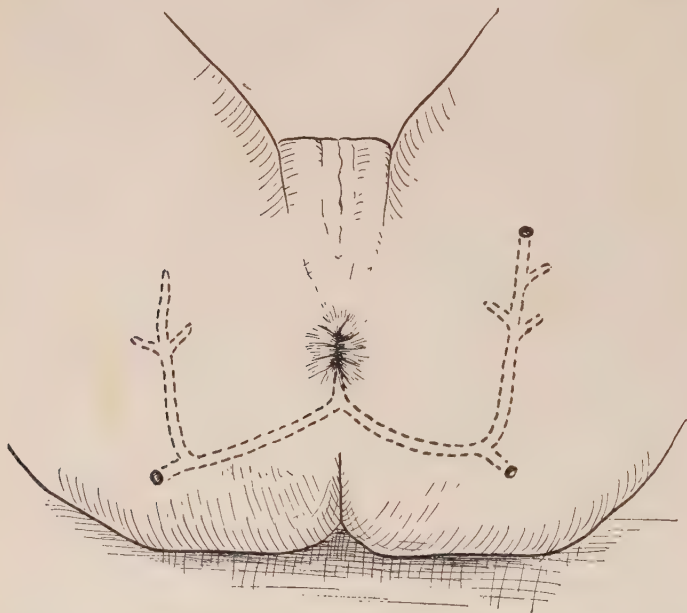


FIG. 30.—A posterior horse-shoe fistula always has an internal opening in the posterior median line no matter how many external openings there may be.

feces; moreover, in these extensive deep fistulæ, division of the muscle causes a good deal of deformity and retraction of the anal orifice during the slow healing process. After the external wound has nearly healed, the opening into the rectum can be laid open. A local anesthetic generally answers for this slight operation.



When, however, the internal opening is a large one, there is not much to be gained by leaving this part of the fistula and, as it will eventually have to be laid open, it is best to do so at once.

In either case, after the main tract and all lateral burrowing have been incised, any sinus which extends deeply

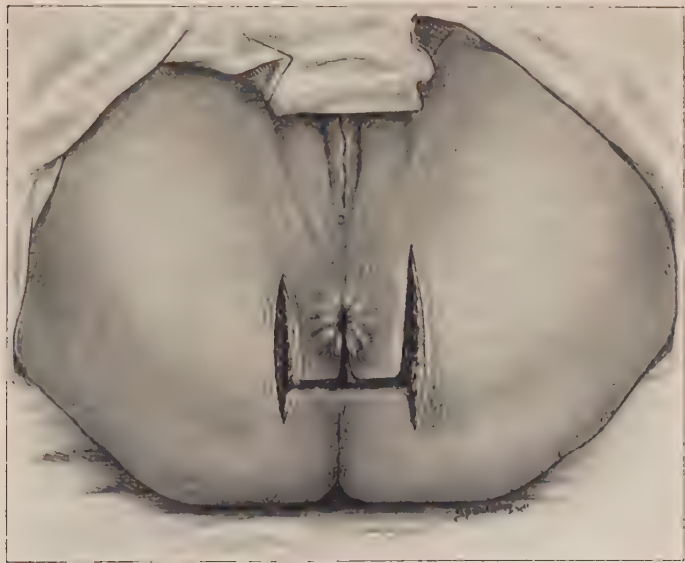


FIG. 31.—“H” incision usually employed for horse-shoe fistula.

along the muscular wall of the rectum should be freely drained by incising the adjacent tissue, so as to render the bottom of the sinus a good-sized open wound. One or more of these sinuses are not uncommon in the posterior horse-shoe fistula. Drainage should be by means of a rubber tube in the wound, rather than by packing with gauze, the tube being shortened as healing progresses.

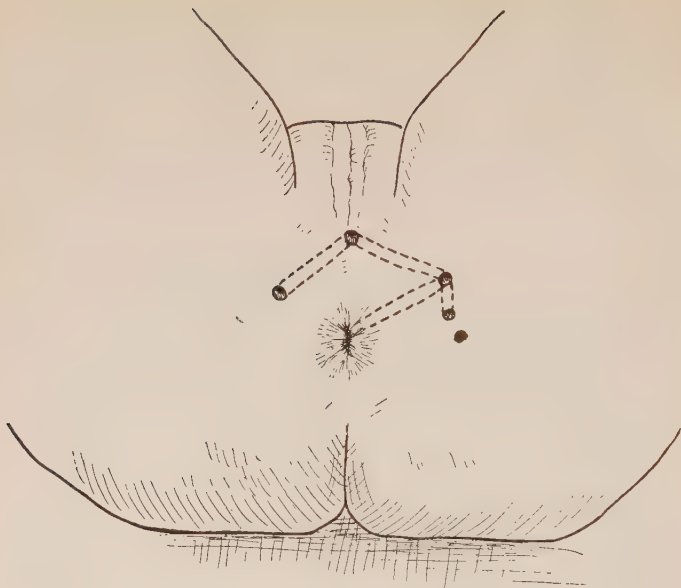


FIG. 32.—Anterior horse-shoe fistula.

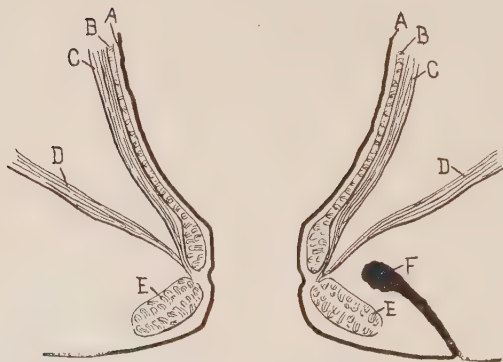


FIG. 33.—Blind external fistula. *A*, mucous membrane; *B*, circular muscular fibers; *C*, longitudinal muscular fibers; *D*, levator ani; *E*, external sphincter; *F*, abscess covered by mucous membrane only.

*Anterior Horse-shoe Fistula.*—There is another variety, known as the anterior horse-shoe fistula (Fig. 31), which is treated in much the same manner as the posterior, except that if the opening into the rectum is located high up, division of all the muscles is dangerous, inevitably leading to incontinence. In the anterior, as in the posterior horse-shoe fistula, any sinus which extends deeply and in close apposition to the rectum should be freely incised and a rubber drainage tube inserted.

*Blind External Fistula.*—A blind external fistula, in my experience, is comparatively rare. When it does occur, this type also may have one or more external openings. The operative procedure is as follows: A probe is passed into the deepest part of the fistula and the tract laid open with a T- or crucial incision. The fistulous channel should then be very carefully probed and if a tract is found extending to the usual location of the internal opening of a complete fistula, with only mucous membrane intervening, the probe should be pushed on into the rectum and the fistula treated as a complete one. In fact, such a fistula is probably in reality complete, but the internal opening is so minute as to be obscured, or else is, for the time being, healed over, only to become reopened upon reinfection from the rectum. In any event, these blind external fistulæ, in which only mucous membrane intervenes between the point of the probe and the finger in the rectum, are exceedingly difficult to cure unless the incision is carried into the rectum.

*Blind Internal Fistula.*—These are of two varieties: One extends out into the ischio-rectal fossa, or more superficial to it, and the other extends under the mucous membrane up the bowel. The latter are sometimes detected as cord-like bands or, at other times, as oval indurated areas.

The submucous fistula is treated as follows: A probe is passed from the lower opening along the fistulous tract to its upper extremity, at which point it is forced through the mucous membrane and either incised or ligated in the manner described for the treatment of submucous abscesses (Fig. 20).

In the variety of blind internal fistula which invades the ischio-rectal fossa (Fig. 34), the finger is passed into the rectum and upon palpation an indurated area can be felt

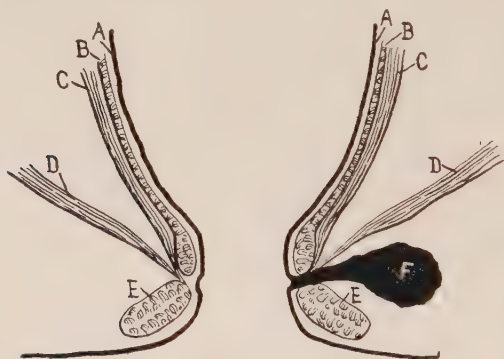


FIG. 34.—Blind internal fistula. A, mucous membrane; B, circular muscular fibers; C, longitudinal muscular fibers; D, levator ani; E, external sphincter; F, abscess covered by mucous membrane only.

and rendered prominent with the flexed finger. This is cut down upon with a scalpel, exposing the fistulous tract, into which a curved director is passed and brought out through the internal opening, as when operating upon a simple complete fistula. In other words, the blind internal fistula has been converted into a complete one.

*Fistula Due to Caries of the Bone.*—This type of fistula is a very rare one, but it should be remembered that it is occasionally met. When due to caries of the sacrum or

coccyx they are generally caused by a tumor, such as a dermoid cyst, upon the anterior surface of these bony structures. They should be treated by free incision and removal of the growth and also of the coccyx or a part of the sacrum, if necessary, after which they heal very rapidly. In still rarer instances they may be due to caries of the bone located more remotely, such as an abscess of the hip-joint, tracking down into the perianal region through the superior pelvi-rectal spaces, either opening externally, or,

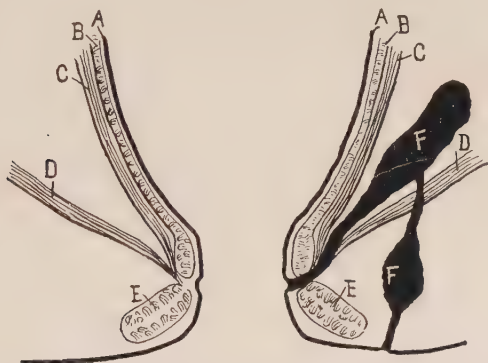


FIG. 35.—Pelvi-rectal fistula. *A*, mucous membrane; *B*, circular muscular fibers; *C*, longitudinal muscular fibers; *D*, levator ani; *E*, external sphincter; *F*, abscess covered by mucous membrane only.

as sometimes happens, up into the rectum as well, when a much more difficult problem must be considered in planning any operative procedure (Fig. 35). In such cases the perirectal sinuses should be thoroughly drained by free incision, but the original focus being located elsewhere, not much can be promised the patient except such amelioration of the painful symptoms as naturally follows when suppurating sinuses are freely drained. If the original focus can be cured, the prognosis in regard to the rectal condition is much better.

A colostomy has been recommended by some surgeons, and surely if the suppuration is very extensive it would seem a reasonable operation, for if the feces are diverted a great part of the local contamination would be arrested. However, this is an extreme measure even in this class of cases.

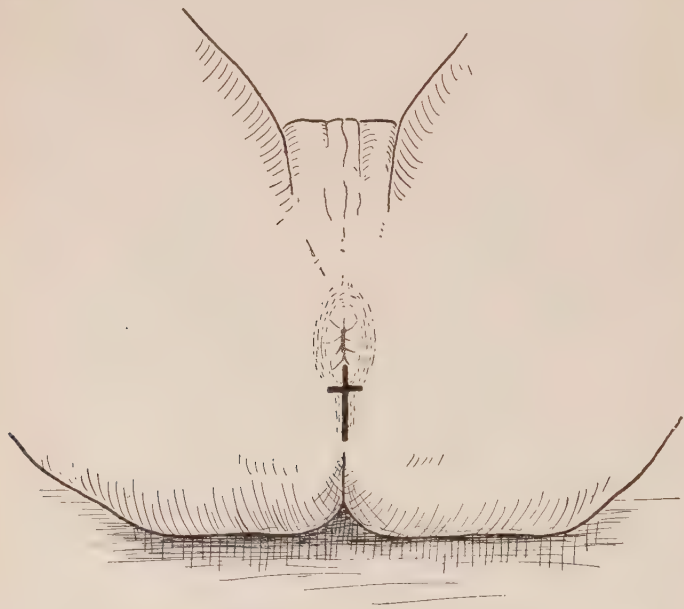


FIG. 36.—Showing lateral incision of the fibers of the external sphincter muscle for fistula of the posterior rectal triangle.

*Fistula of the Posterior Rectal Triangle.*—There are certain fistulæ of the small triangular space posterior to the anus which are very difficult to cure by simple incision. They seemingly present no especial difficulties, but almost invariably fail to heal under the usual method of procedure, as has been pointed out by Brick of Philadelphia.

Now, the usual incision for such a fistula would be an



antero-posterior one, but it will be recalled that posteriorly the external sphincter is attached principally to the coccyx, and as it passes about the anal orifice it forms a Y-shaped arrangement of its fibers. The difficulties often experienced in this class of fistula are that the sinus apparently seems to be doing well at first, but the discharge does not altogether cease and it will be found that a small pocket, more like an ulcer, persists at the ano-rectal line; repeated curettings and applications seem to have little effect upon it. Even the same operation repeated will prove of no avail.

The best way to deal with such a fistula is, after the usual incision has been made, to divide the muscular fibers of the external sphincter on either side for about  $\frac{1}{2}$  inch, near the anal orifice (Fig. 36). This procedure puts the muscle at rest and provides free drainage so that healing is not interfered with by the act of defecation.

*Recto-vaginal Fistula.*—The most common cause of this type of fistula is accidents of parturition. Sometimes there is a complete tear through the sphincter muscle into the recto-vaginal septum. In repairing such a wound after delivery, complete union in the higher part of the wound may not be secured, although the sphincter has healed completely, thus leaving a connection between the rectum and vagina. More rarely, these fistulæ may be associated with local inflammatory conditions of the rectum or vagina, more especially tuberculous ulceration of the rectum, or as an extension of the ulceration around a stricture of the rectum, either benign or malignant. It is also claimed by some writers that chronic vulvo-vaginal abscesses extend up through the septum and in this way produce fistulæ of this nature (Fig. 37).

In operating upon a recto-vaginal fistula caused by parturition, there are two methods. When the sphincter has

been successfully repaired, an attempt should be made to close the fistula by itself, although these are the more difficult cases to cure. The rectum is separated from the vagina, the vaginal end of the fistula is closed by first excising an oval area of the vaginal mucous membrane with the fistulous opening in the center and the long axis of the oval corresponding to the long axis of the vagina. The edges of this incision are then brought together on its long axis without too much tension.



FIG. 37.—Recto-vaginal fistula.

On the other hand, if the sphincter muscle is incompetent, it is advisable to cut through the anus up to the level of the fistula, thus making a fresh complete tear, and then perform a perineorrhaphy.

*Rectal-urethral Fistula.*—This condition usually develops from disease of the membranous or prostatic portion of

the urethra. It very commonly follows an abscess in this locality caused by a stricture. When it is due to this cause the opening into the rectum is anterior and, as a rule, rather superficial. It may follow operations on the prostate or as a complication of cancer of the prostate. It is more rare for the fistula to develop from infections within the bowel.

The operative procedures indicated depend upon the depth of the opening into the rectum. In the more superficial, such as those following stricture of the membranous urethra, all that is ordinarily required is cure of the stricture by dilatation and incision of the fistulous tracts about the rectum where they open into the anal canal. If there is much extravasation of urine, they may require a great deal of postoperative attention in the way of frequent changes of the dressings.

When the opening is deeper in the rectum, this type of fistula is more difficult to cure and requires a carefully planned plastic operation, after the urethral or prostatic pathology has first been removed. It should be approached from the perineum, and the opening in the urethra and rectum repaired separately, after which a retaining catheter should be placed in the urethra and a tube kept in the rectum to prevent an accumulation of flatus. The patient should have been carefully prepared before operation, so that the bowels may be confined for seven or eight days.

*Recto-vesical Fistula.*—This is another form of fistula which should be borne in mind, although it is of infrequent occurrence. It may follow ulcerative conditions of the bladder as well as ulcerative conditions of the rectum; or diverticulitis of the rectum or sigmoid may be the cause. It is also a terminal manifestation of malignant disease of the rectum or bladder. When encountered associated

with cancer, a colostomy is all that should be advised. If due to diverticulitis, in some cases the diverticulum may be removed by an abdominal operation and the opening into the bladder closed. After closing the rectal opening, an attempt should be made to anchor the bowel at some distance from the fistulous opening into the bladder.

**After-treatment.**—The after-treatment of fistula is of much more importance than some surgeons are willing to admit, for no matter with how much pains the operation has been performed, the results will prove an absolute failure in any but the simplest form if great care is not taken to see that every part of the wound heals evenly without leaving any small pockets which will break down after part of the wound has been healed.

All packing should be removed at the end of twenty-four hours, or else allowed to remain for four days, depending, in a large measure, upon the character of the fistula. If removed the day following operation, the gauze comes away rather easily, but on the second or third day it has become adherent and its removal is painful. By the fourth day, however, it has become loosened by the pus on the granulating surface of the wound and is easily withdrawn. While sometimes the packing may be taken out perfectly well at the end of twenty-four hours, if the fistula is large and extends deeply, packing it firmly for a longer time tends to keep the wound well open and has the advantage of making it easier to insert the wick on subsequent visits.

A fistula should be dressed from one to three or four times a day, depending upon the amount of discharge. If profuse, the dressing should be changed frequently. It is a good plan, after the first week, when the wound is not painful, to pass the finger gently throughout the whole extent of the fistulous tract, giving special attention to

the deeper portions where pockets are liable to form. The aim should be to keep the external portions of the wound open until the deeper portions have been filled by granulation. As has been stated, when the fistula is thoroughly incised, very little discomfort is occasioned by the dressings. Much unnecessary distress can be saved the patient



FIG. 38.—A fistula being dressed with finger in the rectum. The gauze wick is kept in contact with the finger rather than the sensitive wound.

by inserting the finger into the rectum as a guide to pushing the wick into this portion of the wound (Fig. 38); when the granulations are healthy, if the gauze is impregnated with sterile vaseline, it will add to the patient's comfort and act as a protective dressing. For this reason it is much better than dry or moist gauze for the purpose.



After the first few days the fistula should be packed very lightly and after a period of ten days or two weeks, except in very large ones, it is necessary only to lay a sterile pad over the surface of the wound. The dressings should be done daily until healing has taken place. Free bleeding from the surface of the wound indicates unhealthy granulations and these should be swabbed with 10 per cent nitrate of silver solution. They should not be allowed to become exuberant, but should be treated when they first appear. Thus, the wound is healthy throughout the healing process. Hot sitz baths twice daily (as recommended under the treatment of abscesses) are very important. The bowels should be opened for the first time on the third or fourth day and after this daily evacuations should be secured. If any bridging or sinuses are found during the after-treatment, they should be promptly incised under infiltration anesthesia, for if allowed to remain they will have to be dealt with later.

**Non-healing of the Wound.**—This may be attributed to one or more of the following five causes:

1. At operation some tract or pocket has been overlooked. This is one of the commonest causes and when, in the after-treatment, such a sinus has been found to exist, the only remedy is a second operation and the sooner this is done the better, for the wound will not heal as long as such a sinus remains.

2. Another common cause for poor operative results at the hands of one inexperienced with fistula cases is the failure to plan the operation so as to secure sufficient drainage. The outer part of the wound heals before the deeper sinuses have been filled in with healthy granulation tissue.

3. The wound is not inspected frequently enough and bridging takes place with the formation of a sinus. When



such sinuses are found, they should be cut through at once. Bridging is prevented, however, when the wound is dressed daily.

4. Very often fistulæ are packed too tightly. On several occasions I have had cases brought to me because of delayed healing, when all that was necessary was to instruct the attendant to discontinue packing the wound. It is a great mistake to do any packing after two or three weeks in any fistula. About all that is necessary is to keep the parts clean and apply a little vaseline as a protective.

5. Serious constitutional diseases, such as tuberculosis, diabetes, etc., are sometimes responsible for slow healing, but in the vast majority of instances the cause is inadequate operation or unskilful after-treatment.

## CHAPTER VIII.

### STRICTURE OF THE RECTUM.

**Definition.**—The word “stricture,” applied to the rectum, means the permanent narrowing of the caliber of this organ. The older writers have always included in their descriptions of this disease a form which they termed “spasmodic stricture.” Whether this form ever exists I am unable to state definitely, but I can say that I have never met one in my practice. From their descriptions, it would seem that they may have thought such a condition to have existed from the ribbon-like stools observed. Such patients usually have hypertrophied sphincters, and it may be that the tightness of these muscles when the finger was introduced gave the impression of a stricture, which gave way as the finger was moved about. Also a hypertrophied condition of the valves of Houston might lead one to infer that stricture was present. It would seem to the writer that, in reality, such a thing as a spasmodic stricture could not exist; therefore, it will not be considered in this chapter.

**Etiology.**—All strictures of the rectum may be divided into two varieties—annular and tubular. The etiology of both varieties is largely identical. They are all caused by the contraction which commonly follows inflammatory and ulcerative processes in the rectum (the remote etiology of which has been considered in the chapter on Ulceration), and for this reason the proper treatment of these conditions should be emphasized. All ulcers heal by granulation, leaving a certain amount of scar tissue, so that one can

readily understand that the amount of contraction which follows healing of the ulcer is in direct ratio to its size. Extensive ulceration which would encircle the gut is very apt to be followed by stricture unless the rectum is dilated at the time, or shortly after the ulceration has been cured.

Traumatism of the rectum, such as in operative procedures for removing hemorrhoids, is often followed by stricture. This is particularly true of such operations as the Whitehead, where all the mucous membrane has been removed throughout the pile-bearing area and the mucous membrane brought down to the anal margin. If the sutures give way the mucous membrane recedes to a higher level, leaving a denuded area which heals by granulation and is very liable to be followed by marked contraction. Also it should be remembered that this complication may follow any of the more frequently employed hemorrhoidal operations, such as the clamp and cautery or ligature methods, provided too much of the mucous membrane is sacrificed or too much of the submucous tissue removed. The granulating surfaces left have a great tendency to cohesive repair, the denuded walls being in close approximation and becoming united in the healing process, thus greatly narrowing the caliber of the gut. These unfortunate sequelæ can nearly always be avoided if moderate dilatation is insisted upon during the first two or three weeks following such operations, before the adhesions become firmly established.

Stricture at the anal orifice is nearly always due to too free removal of the anal skin during hemorrhoidal operations. When such wounds heal the skin which covers the external sphincter becomes so contracted that it will not allow dilatation of the external sphincter. Also the muscle is rendered rather immovable by the cicatricial tissue which insinuates itself into its fibers at two or three

points. In other words, stricture, as commonly met with at the anal orifice, is due to too free removal of the external skin; while that at the level of the internal sphincter is due to too free removal of the mucous membrane, or infective ulceration of this region following a hemorrhoid operation; strictures above this level, in the rectum proper, are due to ulceration alone.

As strictures above the internal sphincter are much more frequent in women than in men, the proportion being about 5 to 1, there must be some explanation of this peculiarity. Stricture of the rectum is practically never encountered under the age of twenty, and in the large majority of cases it occurs during the child-bearing period. Chronic endometritis has been noted in conjunction with the higher strictures, and it would seem reasonable to suppose that a round-cell infiltration might extend to the submucous tissues and this inflammatory process be followed by fibrous tissue which would produce a stricture. Very commonly there is a history of difficult labor, where the forceps may have been used in delivery. Long pressure of the head and the traumatism which would follow such labors would be very apt to cause injury to the rectum and be followed by ulceration and stricture. This would seem to me a good explanation of the greater frequency of stricture in women than in men.

The popular impression that all strictures of the rectum are due to syphilis I believe to be a great fallacy. How this belief gained such wide circulation among the profession is difficult to understand, as antisyphilitic treatment has never yet been known to relieve or improve a rectal stricture. Naturally, one would hardly expect, after a syphilitic infection had been allowed to run its course with the formation of sufficient fibrous tissue to produce a strict-

ure, that this could be removed by syphilitic treatment. One would expect, however, a salutary effect upon the ulceration; yet this is not at all improved or the amount of discharge materially diminished. Although strictures do occur in syphilitic subjects, I would venture to question the accuracy of the statements of those who hold the theory that nearly every stricture of the rectum is syphilitic in origin.

**Symptoms.**—Stenosis of the rectum causes a distressing array of symptoms, chief among which are frequent evacuations of the bowels, which are at all times incomplete, resulting in a great deal of straining and tenesmus. There is always a sensation in the rectum which gives the sufferer a desire to go to the toilet. Complete relief, as in the normal individual, is rarely experienced. These annoying symptoms vary with the completeness of the stricture, for as the disease progresses these patients are never wholly relieved of the desire to move their bowels. The obstruction causes a good deal of abdominal distention and griping abdominal pains, especially during the period of increased peristalsis which follows the taking of food. The colon becomes loaded and distended with fecal matter, and the only time such patients are comparatively comfortable is after the use of laxatives and enemata, when they may enjoy a respite from these symptoms for a short time. Owing to the constant pressure of accumulated fecal matter above the stricture, ulceration always takes place, resulting in the passage of pus and blood in amounts governed by the extent of the process. Below the stricture there is very little ulceration. When the stenosis is above the internal sphincter, hemorrhoids are generally present and often a patulous condition of the anal orifice will be noted. Sometimes there are resulting abscess and fistulæ.

In addition to the local symptoms, the general health is undermined; the appetite is poor; there is a great deal of indigestion and the patient has lost weight.

**Diagnosis.**—There are two forms of stricture—the benign and malignant—and the only point of importance is the differentiation between these two. When a cancer has resulted in rectal stenosis, a mass of variable size can easily be made out both by digital and proctoscopic examination. On palpation, this gives the impression of a tumor much like the cervix uteri, except that it has a nodular feel and is often associated with invagination of the mass. The normal mucous membrane surrounding such invaginations gives them the smooth feel of a normal cervix.

A benign stricture of the rectum, on the other hand, when encountered at the anal orifice or at the level of the internal sphincter, can never be mistaken for anything other than an inflammatory stricture. At the anal orifice the overlying skin is tightly drawn down by scar tissue and will rarely admit the index finger. At the level of the internal sphincter there is an annular, band-like constriction which feels almost as though a string were insinuated beneath the mucous membrane and tightly tied. Above this level the stricture gives the sensation of passing one's finger into the mouth of a funnel. It is not nodular like cancer, but smooth and hard. In the tubular stricture there is quite a mass, but in the annular type this is not a feature. It is unusual to find an annular stricture more than  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in thickness, so that the tumor effect is not well marked, a fact which helps to differentiate it from cancer.

**Treatment.**—The treatment depends upon the location of the stricture. When the stenosis is situated at the anal margin, gradual dilatation causes so much pain and trauma that it is hardly worth while even to attempt this method.



A simple operative procedure, which may be carried out under local anesthesia in most instances, is performed as follows:

The parts are rendered insensitive by injecting a 1 per cent solution of novocaine in the right posterior quadrant in the same manner as described for the division of the sphincter for the cure of anal fissure (page 81). Infiltration should be carried rather deeply and well forward on both sides. This will enable the operator to insert the index finger into the rectum. Then, with an ordinary scalpel, the whole of the external sphincter muscle is divided and the incision carried  $1\frac{1}{2}$  inches outside the anus. It is unnecessary to divide the fibers of the internal sphincter, and this should be carefully avoided as a rule. However, sometimes the internal sphincter seems to share in the stenosis. Under such circumstances, I do not hesitate to divide a few fibers of this muscle as well, though this is risky for one inexperienced in rectal surgery, as a degree of incontinence might follow. The internal sphincter usually can be dilated sufficiently at this time to meet all requirements. The incision is now packed tightly with sterile gauze, which is allowed to remain for four days until the bowels are first moved. The object of keeping the pack in so long is that there may be a wider separation of the strictured area so that the resultant scar will be broader. The wound should be wicked until healing is nearly complete and at intervals of two or three days the finger should be inserted for dilating purposes to make sure that the anal circumference is maintained. So far as my experience goes, this simple operation has resulted in permanent cure of these strictures. Of course, if it should subsequently prove that the anal orifice is not sufficiently relaxed, the same procedure could be carried out on the left side without any danger of incontinence.

*Annular Strictures Occurring Near the Level of the Internal Sphincter.*—When seen early, following hemorrhoidal operations, digital dilatation is all that is required. This type of stricture is due partly to cicatricial tissue and partly to adhesions of the walls of the anal canal, which are so loosely formed that they are easily broken down.

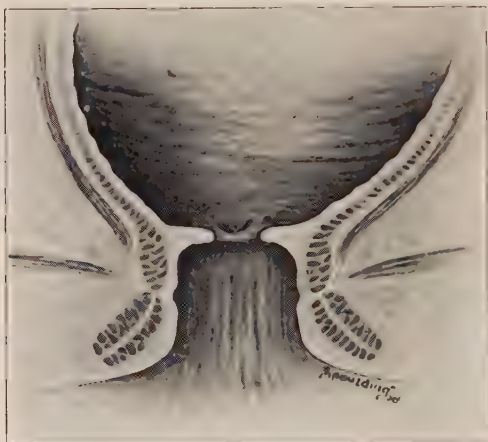


FIG. 39.—Annular stricture at the level of the internal sphincter.

When a stenosis at this level is first seen three or four months after operation, it is more firmly established and dilatation is very apt to be unsuccessful; in fact, usually is. These postoperative strictures are rarely associated with any ulceration and for this reason the operation described below is invariably successful.

With the patient in the lithotomy position, fully anesthetized, the finger of the left hand locates the stricture, when it is divided in the posterior-median line. A tenotomy knife, which slides along the palmar surface of the finger through the stricture, is useful for this purpose. The

incision is made to sever completely the cicatricial tissue, but the muscular wall of the rectum should not be divided. The finger now slips readily into the rectum and similar incisions are made upon the right and left sides. This should completely relax the sphincter so that a duck-bill speculum can be inserted, after which the edges of the incised wound are sutured with catgut in a longitudinal direction. By suturing in this way, the new cicatricial tissue forms vertically instead of laterally.

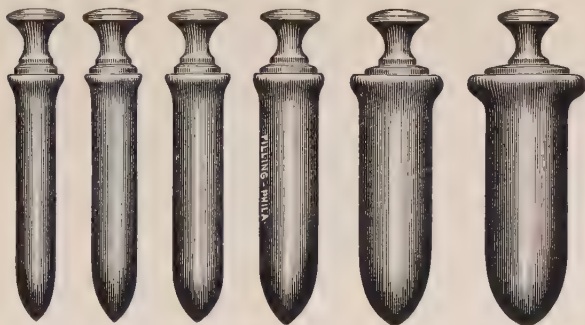


FIG. 40.—Pratt's rectal dilators.

After this operation metal dilators should be used three or four times a week for the first month, after which they should be gradually discontinued. A dilator 1 inch in diameter is as large as is ever necessary (Fig. 40).

A *tubular* or *annular stricture* may be located at the level of the internal sphincter or anywhere else throughout the rectum. The commonest location is within 2 to 3 inches of the anus. In the tubular stricture there is always a good deal of ulceration for 1 or 2 inches above the point of greatest constriction. This inflammatory process infiltrates through the muscular wall of the rectum to the

structures surrounding it and is followed by the formation of a dense cicatricial mass. This perirectal infection results in a tumor, often of considerable size, which may completely encircle the rectum. These are really very difficult cases to do much for, at least so far as offering any hope of



FIG. 41.—Annular stricture of middle portion of rectum. There is always more or less ulceration above this stricture. A stricture of this kind is more amenable to dilatation than the tubular variety.

a cure, although much can be done to ameliorate the more distressing symptoms. Some patients can be made very comfortable by gradual dilatation, which must, however, be persisted in throughout their whole lives. A soft rubber, olive-tipped Wales' bougie (Fig. 43) is the safest and most

useful dilator to employ. One should have a graded assortment, the largest of which need not be over 1 inch in diameter,



FIG. 42.—Tubular stricture. In rare instances this type of stricture occludes the whole rectum.

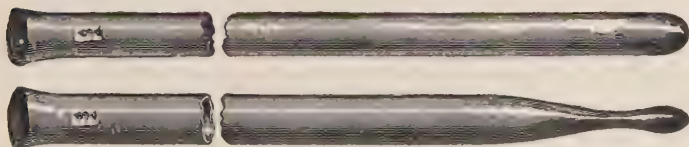


FIG. 43.—Wales' soft rubber bougies.

for experience has shown that if the caliber of the stricture can be maintained at from  $\frac{3}{4}$  to 1 inch, quite as much relief is afforded as to attempt to dilate to greater dimensions. This will allow free and complete relief of the bowels and if dilatation is carried further it will result only in increasing the discomfort of the patient, without any compensatory benefits to be derived therefrom. Dilatation of a tubular stricture is rather painful at the best and for this reason one should proceed slowly and not attempt too much at one sitting. A bougie which puts the stricture on a moderate stretch and can be fairly well borne by the patient should be allowed to remain for ten minutes. At the next visit a larger one very likely can be used, but it is better to take the progressive steps slowly.

Forcible dilatation is recommended by some authors, but there is great danger in this procedure. If the stricture is located low down a rupture of the rectum is likely to be followed by perirectal abscess, whereas if it is above the reflection of the peritoneum it is even more dangerous, as perforation here will be followed by general peritonitis. I have, however, in a few instances, begun treatment by administering an anesthetic and with the greatest care and gentleness accomplished as much as would be required in several weeks' gradual dilatation. One must use the greatest care, however. When there is much ulceration above the site of the stricture, it is a good plan to irrigate the rectum through the bougie after each treatment.

*Linear Proctotomy.*—Although this operation is in no sense curative, I have used it with much satisfaction in annular stricture not more than 3 inches above the anus. One objection to its use is that it may be followed by incontinence, but thus far I have never had this unpleasant



experience. I have, however, always made inquiries about the previous condition of the bowels—whether the patient had been costive or had had a tendency to looseness of the bowels. If the patient formerly passed well-formed and hard feces, or was a little inclined to be constipated, I do not believe he will have anything more than a temporary incontinence following this procedure. The operation is performed as follows:

With the forefinger of the left hand passed up to the level of the stricture, an incision is made through it and the supervening tissues to a little past the coccyx. Some hemorrhage is liable to follow this incision, which necessitates the ligation of a few spurting vessels. A tube is passed into the rectum and the wound firmly packed with sterile gauze which is removed on the second or third day, after which it is treated as a fistulous wound. This operation improves the ulcerated condition by affording free drainage and if a certain amount of dilatation is kept up with the Wales' bougie, a long period of relief may confidently be looked forward to, and in many instances a cure effected.

*Excision of the Rectum.*—A perineal excision of the rectum has been practised by a good many surgeons and excellent results have been reported, but a complete excision is an operation which should not be lightly undertaken. In the type of case in which this operation seems to be the last resort, there is invariably so much perirectal suppuration that it is particularly dangerous.

Resection of the stricture also has been done for this condition, but has always been followed by recurrence.

*Colostomy.*—When stricture of the rectum has not been benefited by the palliative and operative methods just described, a permanent colostomy must be resorted to and

is the only measure which will prolong and save the patient's life.

*Diet.*—Outside of the purely surgical measures, attention to the diet and regulation of the bowels are necessary. A nutritious but not too bulky diet should be taken; spinach and other rough vegetables, and particularly rice, should be avoided. Patients with a constipated habit should have laxatives prescribed as required. Liquid petrolatum,  $\frac{1}{2}$  ounce, three or four times a day, because of its lubricating action, is particularly indicated.

## CHAPTER IX.

### HEMORRHOIDS.

OF all diseases of the rectum, hemorrhoids are by far the most common, comprising in both private and hospital practice a good proportion, possibly 30 per cent, of the rectal cases the proctologist is called upon to treat. Indeed, they are of such frequent occurrence that the laity designate nearly every rectal affection as "piles," and often evince surprise if the proctologist's diagnosis falls in quite another category.

**Definition.**—"Hemorrhoids are varicose tumors, involving the veins and capillaries of the mucosa and submucosa of the lower rectum, characterized by a tendency to bleed" (Gant), and designated as "external" or "internal," according to whether their attachment is above or below the muco-cutaneous line.

**Etiology.**—There have been many plausible theories advanced to account for the development of hemorrhoids, and there is no doubt that, if one attempts to determine the exciting cause in a large number of cases, most of these theories will have to be invoked from time to time as etiological factors.

Such predisposing causes as age, sex, parentage, occupation, habits, environment, improper diet, the abuse of cathartics, enemata and complicating affections of the bladder, prostate, uterus, liver, heart and kidneys—all may be said to transmit a tendency, increasing the liability

to hemorrhoids, if not of themselves alone active causes of this disease.

Thus, though hemorrhoids are met with at all ages, they are medical curiosities in infancy, uncommon at puberty, most frequently found at middle age and frequently manifested in old age.

Statistics are unreliable as to the sex element. It has generally been stated that the proportion is about 2 males to 1 female. This may be accounted for by the fact that many rectal ailments occurring in connection with women's diseases are treated by gynecologists, also that women accustomed to the monthly menstrual flow do not attach so much importance to rectal hemorrhages as do men. So that, while the statistics usually quoted show a preponderance of this disease among men, it is more than likely that they do not represent correctly the ratio existing between the two sexes.

A sedentary life has much influence in causing piles. If one engaged in a sedentary occupation were to devote a certain amount of time to outdoor exercise, as walking, riding, or athletic games, the environment of itself would be of little moment, but when muscles are used but little, they become atrophied and relaxed, the general health is impaired and frequently constipation supervenes and straining at the toilet is necessary to unload a sluggish bowel of its fecal accumulation. On the other hand, many engaged in arduous labor involving great straining, as in lifting heavy merchandise, are prone to piles. It is safe to say, however, that a sedentary life is intimately associated with the development of hemorrhoids in the majority of those who suffer from them.

Improper diet (by causing constipation), drastic cathartics, affections of the bladder, urethra, prostate and uterus

(by inducing great straining) are potent factors in the production of piles. Many other diseased conditions might be mentioned and discussed at length as predisposing causes, but the basic cause for the prevalence of hemorrhoids is purely anatomical, for the erect posture, and the absence of valves in the portal venous system afford the most satisfactory explanation of their development. The small sacculated veins comprising the venous tufts are subject to a continuous pressure from the blood contained in the several vessels extending from the anal orifice to the liver. If these veins were supplied with valves, which would very materially relieve the backward pressure, the danger of distention and dilatation of the small veins comprising an internal pile would be materially lessened. It will thus readily be seen that the pathological conditions previously mentioned predispose to hemorrhoids by obstructing the return of blood by pressure on either the abdominal veins or the terminal veins of the rectum and anus.

A good example of such pressure is furnished by an overloaded colon, a pelvic tumor, associated with hemorrhoids, or the phenomena of pregnancy. It is a well-known clinical fact that piles which develop during the last months of pregnancy will generally disappear a short time after confinement, which simply demonstrates that after a temporary obstruction the dilated veins will sometimes resume their normal character.

In the same way the pressure exerted upon the terminal veins of a rectum constantly distended with feces is an active source of hemorrhoids. Prolonged straining at the toilet in the act of which every force possible is exerted to obstruct venous return and dilate the hemorrhoidal vessels, is often productive of piles. The nates are pulled apart, the anal margin everted, the sphincters relaxed, the terminal veins

of the rectum are pressed upon by the fecal mass above, and, in addition, the action of the abdominal muscles exerts pressure upon the mesenteric veins by compressing the intestines.

In a few words, therefore, the etiology of hemorrhoids may thus be summed up: While the conditions already enumerated predispose to their development, the *fons et origo mali* is to be sought in circulatory obstruction produced by pressure upon either the abdominal or rectal veins, which retards the return of venous blood to the liver, thus increasing the pressure in the hemorrhoidal zone.

**Classification.**—The very confusing and altogether useless nomenclature of medical literature employed in describing the different kinds of hemorrhoids may be ascribed, in a large measure, to the custom of applying various terms to the several changes through which every hemorrhoid passes in the course of its development. As a matter of fact, the term “external” or “internal” signifies its chief characteristic in so far as either diagnosis or treatment is affected, the former term indicating a cutaneous fold attached to the anal margin, external to the muco-cutaneous line and always covered with true skin; the latter, a varicose tumor attached to the anal canal above the muco-cutaneous line and always covered with mucous membrane. For this reason the designation of a hemorrhoid as either “external” or “internal,” or when a combination of both is present “externo-internal” reduces the general classification to simple, definite and precise terms.

### EXTERNAL HEMORRHOIDS.

These may be either thrombotic or cutaneous.

**Thrombotic.**—**Definition.**—The thrombotic hemorrhoid is a pear-shaped or oval swelling, varying in size from that



of a pea to a small English walnut, cystic in character, occurring underneath the muco-cutaneous surface at the anal margin, generally single but not infrequently in groups of two or three. It is caused by the rupture of a vein during coughing or straining, or by a thrombosis induced by some inflammatory condition of the inferior hemorrhoidal vein. The majority of these tumors are of the former variety.

There has been an almost endless discussion among rectal surgeons as to whether this variety of hemorrhoid is a thrombus or an extravasation of blood due to the rupture of the vein wall. In my practice, both varieties are frequently met with and, as their treatment is identical, it is of such little importance as to render further discussion unprofitable.

A history of hemorrhoids developing suddenly in a patient previously free from this affection usually indicates the thrombotic variety; if, upon separation of the buttocks, an oval or pear-shaped swelling comes into view (there may be two or three), partially occluding the anal orifice, it is fairly safe to assume that this diagnosis has been verified. The overlying skin is either of a dark blue or cystic appearance, depending upon whether the clot is superficial or more deeply imbedded. When the clot is close to the integument, the dark blue color may closely resemble a strangulated internal hemorrhoid, thus leading to the occasional inexcusable confusion of the two and the unnecessary pain of attempted reduction; but close inspection will show the greater part of the tumor to be external to the muco-cutaneous line and covered with true epidermis.

A thrombotic hemorrhoid is particularly painful in the first stages before the clot has been absorbed sufficiently to relieve the pressure upon the sensitive nerves at the anal

margin. As a rule, during this period, which lasts five or six days, it is with great difficulty that the patient is able to go about, and even sitting down is decidedly uncomfortable.

**Treatment.**—*Palliative.*—Under palliative measures, which may consist of rest in bed and the securing of soft movements of the bowels with mild saline aperients, the application of soothing lotions, such as the lead and opium wash, and hot or cold boracic fomentations applied continuously to the anal region until the clot has been absorbed, the swelling either gradually subsides in two or three weeks or a marginal abscess develops *in situ*. Because, however, of its tediousness and the more or less pain associated with this method, and because a thrombus is one of the best culture mediums in which to develop pyogenic organisms, other than operative treatment—except for the very small ones—is never advisable.

*Operative.*—The most popular operation at the present time is enucleation of the clot by incision, under local anesthesia. With a hypodermic syringe, to which is attached a fine, sharp-pointed needle, 0.5 of 1 per cent solution of novocaine is injected in the following manner: With the left index finger and thumb the perianal skin near the swelling is grasped and pinched for a moment to numb the part, the needle then inserted very superficially under the skin, and the whole of the top of the tumor well over into the anal canal slowly injected. It is best not to inject within the swelling, but simply in a line of the proposed incision. Then with a curved bistoury the base of the swelling is transfixed and cut outward. The clot usually expels itself, but if necessary may be curetted lightly. The wound is packed firmly with a strip of gauze, which should remain *in situ* for twenty-four hours that another clot may not form.

There are three objections to this operation: (1) If the small wick slips out another extravasation may immediately take place. (2) The wound heals by granulation, which requires from a few days to two weeks. (3) A cutaneous hemorrhoid is often left behind, caused by the inflammation of the connective tissue surrounding the clot.

An operation much more effective, quite as simple and giving immediate relief from all pain, is performed as follows: A hypodermic syringe is filled with 0.5 of 1 per cent novocaine solution, and the needle is inserted in the center of the hemorrhoid, for at this spot the prick of the needle produces no sensation. From this single puncture, by withdrawing and reinserting the needle, the whole of the swelling is infiltrated immediately beneath the skin (Fig. 44). With a sharp scalpel a skin incision, beginning above, near the anal orifice, is carried about the base of the swelling on one side, to a little beyond its external limits. A similar incision on the opposite side completes the elliptical section of skin to be removed. The lower angle of the area thus marked off is next seized with a pair of pressure forceps and while elevated, the clot, capsule and overlying skin are dissected out *en masse*. The bleeding is free for a few moments, and if not easily arrested by pressure two or three catgut sutures are employed to close the incision (Fig. 45).

The edges of the wound approximate perfectly, and if the parts are kept clean and a sterile gauze dressing applied for two or three days, primary union is secured. The painful symptoms at once subside and the patient can go about much as usual immediately after the operation, without the discomfort that follows the first procedure described, or the still greater discomfort that invariably is associated with the use of lotions, ointments or other palliative measures.



FIG. 44.—Line of incision for excising a thrombotic hemorrhoid.



FIG. 45.—Catgut sutures in place after excision of a thrombotic hemorrhoid.

**Cutaneous Hemorrhoids.**—**Definition.**—A cutaneous hemorrhoid is an enlargement of one or more of the normal folds about the anus. In some individuals the skin in this region is very redundant, extending entirely around the anal margin; in others it appears as “skin tabs” with a broad base, as teat-like projections, or, more rarely, distinctly pedunculated.

Ordinarily, a cutaneous hemorrhoid causes little inconvenience save the greater attention required to keep the parts clean. At times, however, when insufficient cleansing of the parts has allowed the accumulation of rectal secretions or fecal matter, a pruritus is incited and inflammation, consequent upon scratching, with resultant extreme pain on walking or sitting.

**Treatment.**—*Palliative.*—The non-operative treatment of this variety comprises regulation of the bowels with an appropriative laxative, scrupulous cleanliness, the anal region being wiped carefully with absorbent cotton wrung out of hot water after defecation and before retiring at night followed by the application of a soothing ointment such as:

R—Morphinæ sulphatis . . . . .	grs. iv
Hydrargyri chloridi mitis . . . . .	grs. x
Adepis benzoinati . . . . .	℥j

or

R—Cocainæ hydrochloridi . . . . .	grs. v
Ung. aquæ rosæ . . . . .	℥i

or the following solution

R—Phenolis . . . . .	grs. x
Zinci oxidi . . . . .	℥ij
Liquor calcis } . . . . .	āā ℥iij
Aquæ rosæ } . . . . .	

*Operative.*—Operative treatment is preferable, not only to cut short the inflammatory period but also to forestall the

possibility of recurrent attacks. After infiltrating with novocaine, 0.5 of 1 per cent, and using aseptic precautions, these hemorrhoids may be painlessly removed with a pair of curved scissors. If the base of a hemorrhoid is broad, rather than allow the wound to heal by granulation, the edges should be united with two or three fine catgut sutures. It is necessary to remove only two or three hemorrhoids at one time, even though others are present, since any further redundancy will be taken up by the contraction which follows the operation.

**Complications.**—Anal fissures, concealed ulcer, or a marginal or submucous abscess may often be associated with inflamed external hemorrhoids, and when the pain is unusually severe at the time of defecation or the external sphincter is much hypertrophied, it is more than probable that complications exist. When present, they should be dealt with as described in the chapters on these subjects.

### INTERNAL HEMORRHOIDS.

**Symptoms.**—The symptoms of internal hemorrhoids, in a general way, may be grouped under several divisions, any one or several of which may be the reason a patient seeks professional advice. These are: (1) Pain; (2) protrusions; (3) hemorrhages; (4) excess of normal rectal secretion; (5) reflex disturbances.

1. *Pain.*—Unless inflamed or strangulated, or complicated by other conditions, internal hemorrhoids are not painful. Patients usually complain of a smarting, throbbing sensation at the time of defecation, but this soon passes away after the tumor has been returned within the rectum. A dull, aching sensation over the sacrum may be noted in some cases. If strangulated, they often give rise to intense pain of an aching, throbbing character. They are then



very tender to the touch and the anal skin becomes edematous and swollen. The patient is able to go about with much difficulty and can render himself in a measure comfortable only by assuming the reclining position. In many cases it is impossible to effect a proper reduction because of the associated swelling of the skin at the anal margin, which, by its retracting effect, causes them to protrude again very soon.

2. *Protrusions*.—Protrusions and hemorrhages are the two most annoying symptoms of internal hemorrhoids and it is for their relief that the patient usually first seeks advice. The protrusions at first are small and retract themselves, but, as the tumors gain in size, they drag down upon the mucous membrane to such an extent that the action of the sphincters prevents their being spontaneously reduced, and, as a result, the patient is compelled to perform the disagreeable act of replacing them after defecation. In long-standing cases the sphincters become greatly relaxed and, consequently, the tumors are prolapsed after such slight exertion as lifting or coughing, and finally they are constantly protruded during the simple exertion of walking about.

3. *Hemorrhage*.—Hemorrhage is usually the first warning to the patient that something is wrong with his rectum. A little bright red blood is noticed at stool, generally occurring when the bowels are constipated, the hard masses causing abrasion of the mucous membrane, which is very thin and delicate when the tumors are small. As the hemorrhoids increase in size, the connective-tissue elements are also increased and the growth becoming less vascular and friable, hemorrhage becomes a less important feature. This fact is only so in a general way, as it is the preponderance of either the connective-tissue elements or the dilated veins of which every pile is composed that determines its

tendency to bleed. It is this feature which has given rise to the rather confusing classifications which are to be found in many text-books on this subject, such, for instance, as the arterial pile, venous pile, capillary and connective tissue hemorrhoid, etc. All these names, in fact, refer to the same growth, contain the same elements, but are in a different stage of development, and this superimposed nomenclature serves no useful purpose.

4. *Excess of Normal Secretion*.—In the later stages, when the hemorrhoids are protruded much of the time, the normal secretions of the rectum are increased; the mucous membrane is excited to hypersecretion, due to the chafing effect of the buttocks or clothing, and the sphincters being relaxed, allow the mucous to escape in such quantities as to be most annoying as well as uncleanly.

5. *Reflex Disturbances*.—While it is rare that hemorrhage occurs so frequently and in such large quantities as to affect the general health, yet the continuous loss of even small amounts of blood may in time, produce severe anemia, cardiac weakness and a general appearance resembling that of malignant disease. As an underlying cause of secondary anemias, hemorrhage from internal hemorrhoids is a not unimportant factor. Furthermore, reflex disturbances of both the male and female generative organs are sometimes cured by hemorrhoidal operation. It is not meant to imply that this is frequently the case, but occasionally, when these organs have been found to be normal and hemorrhoids were present operative measures have cleared up the other symptoms.

**Diagnosis**.—The presence of internal hemorrhoids can usually be ascertained by inspection or digital examination, being in some cases apparent immediately, while in others, by slightly everting the anal orifice and requesting the

patient to strain down, they are at once brought into view. In cases of long standing the sphincter muscles have become more or less dilated by the continual protrusion of the hemorrhoids.

When the hemorrhoids are comparatively small and the sphincter muscles more firmly contracted, they are not so readily protruded and a digital examination is necessary. Simply inserting the finger will not reveal these vascular tumors, but by gently palpating from side to side a general redundancy of the mucous membrane will be noted. This redundancy is not always apparent to the beginner in this work and requires a very light touch, for, if firm pressure is made, the pile at once disappears. If one is unable to satisfy himself as to the presence of hemorrhoids, he may resort to a small enema of 2 drams of glycerin to  $\frac{1}{2}$  pint of water and observe the conditions after the bowels have been relieved. This measure, if the hemorrhoids have attained any size, will bring them into view. In the very earliest stages, when the piles do not protrude, I have found my anoscope, describe on page 24, of the greatest assistance. These small tumors bulge into the window of the instrument and can be readily detected.

A careful preliminary examination is of the utmost importance before undertaking any form of treatment, not alone to determine the exact location and size of the tumors, but also to learn whether any other condition, such as fissures, fistulæ, ulcers, or even malignant growths are coexistent.

**Treatment.**—It is of considerable surgical importance to comprehend clearly the arrangement of the bloodvessels included in an internal hemorrhoid. An internal hemorrhoid may be defined as a varicosity of the small veins embraced in a saccule of the areolar submucous tissues of

one of the longitudinal folds of the anal canal (columns of Morgagni). This so-called tuft is made up of dilated capillaries and connective tissue. It is attached at its upper extremity to a vein and artery (one of the seven terminal branches of the superior hemorrhoidal artery and vein) which lie close together superficially under the mucous membrane. This tuft, which constitutes the internal hemorrhoid, is pear-shaped, and the artery and vein may be said to enter at the stem.

By keeping in mind this simple vascular arrangement, the significant features of the different operative procedures employed for their removal are readily comprehended. For example, a dissection of a varicose hemorrhoid may be carried well up into the anal canal, leaving the tumor attached only by a narrow pedicle, without fear of hemorrhage, provided the large central artery is left intact in the pedicle. There will be more or less free oozing, following the separation of the hemorrhoid from its bed of submucous tissue, but it is of little consequence, and soon subsides, as the sphincters recontract after the operation. It is this freeing of the hemorrhoidal mass, as described, from the adjacent structures that constitutes the basic principle of the most popular operations of the present day—ligature and clamp and cautery. In operation by the first method, the central artery is ligated; while in the latter it is crushed and cauterized.

**Palliative Treatment.**—Although palliative methods promise little in the way of permanent cure for a well-marked case of hemorrhoids, yet the opposition of timid patients to operative treatment makes obligatory such judicious application of local measures as will afford some relief. They are sometimes successful in the early stages and always merit a thorough trial in all cases in which the

hemorrhoids never protrude. After they have reached the state of protrusion, all that can be hoped from this plan of treatment is the relief of some of the more urgent symptoms, such as bleeding, soreness and pain.

The injection of 1 ounce of olive oil before retiring is one of the best palliative measures for internal piles. It not only relieves the constipation, but lubricates the fecal mass so that it is passed with the least injury to the hemorrhoidal tumors.

Ointments are of much service in diminishing pain and preventing inflammation. By applying them immediately after a movement of the bowels, they come in direct contact with the tumors and enable the patient more easily to return them above the grasp of the sphincter muscles. Prompt reduction of the piles is secured by bathing the parts thoroughly with hot water after a movement of the bowels and applying an ointment. While the ingredients that are incorporated in the salve are not so important as the method of application, the following simple ointments are useful in this way:

R—Acid borici . . . . .	grs. x
Ung. aquæ rosæ . . . . .	℥j

or

R—Hydrarg. chlor. mit. . . . .	grs. x
Ung. aquæ rosæ . . . . .	℥j

Apply freely to the rectum after the bowels have been relieved, and at night. If there is considerable pain present, an ointment containing cocaine or morphine will be found useful, such as the following:

R—Cocainæ hydrochloridi . . . . .	grs. vj
Mentholi . . . . .	grs. x
Adipis benzoinati . . . . .	℥j

R—Morphinæ hydrochlorati . . . . .	grs. x
Ext. balladonnæ . . . . .	℥ss
Adipis benzoinati . . . . .	℥j

For many years suppositories have been much in vogue and many drugs and various combinations have been recommended as being especially useful in the treatment of internal piles. They are efficacious chiefly because of the fact that it is almost impossible to insert them without reducing any piles that may have been prolapsed. A simple suppository of cocoa butter answers for this purpose very well, but the antiseptics and such drugs as cocaine, morphine, extract of belladonna, ichthyol, iodoform, aristol and adrenalin chloride may all be used in this way, as seems best suited to the case in hand.

Some surgeons advise, when the hemorrhoids are very actively inflamed or become ulcerated and gangrenous, as may be the case when they are strangulated, putting the patient to bed and applying hot fomentations of boric acid solution. The lead and opium wash has been much used for this purpose and does, to some extent, allay the pain. It was formerly thought that there was a great deal of danger in operating on strangulated hemorrhoids, but such has not proved to be the case. I have operated upon many of these cases, some of which were gangrenous and sloughing, without any complications arising. On the other hand, I have seen several instances of abscesses, fistula and troublesome ulceration arise from the palliative course of treatment. Altogether, it is much the wiser course for the patient to decide to have a permanent cure. The discomfort incident to hemorrhoids in a strangulated state will generally induce patients to decide upon operation, especially when it is made clear to them that the loss of time under either operative or palliative treatment is about equal and that the former precludes the possibility of recurrence. The ligature or clamp and cautery are the best operations for strangulated piles. The pain will be at once



relieved by the stretching of the sphincters and by the free bleeding incident to the operation, which reduces the edema.

*Injection Method.*—Another palliative measure which will eventuate in a radical cure in many instances is known as the injection method. Nearly all the solutions formerly used for this purpose contained carbolic acid, such as Shuford's solution, recommended by Tuttle. The use of carbolic acid as an injection fluid originated in this country many years ago, and was widely exploited, principally by irregular practitioners and advertising specialists. The blatant claims of these originators and its indiscriminate application to the most unsuitable cases and under the most undesirable environment, early condemned it.

The object of the injection method was to set up inflammation within the pile tumor by the injection of an irritant which would produce a gradual obliteration of its vessels without causing a slough of the hemorrhoidal tissues. When using phenol, even in dilute solutions, this happy result was frequently difficult, as it depended entirely upon injecting just the exact amount and strength of solution. The strength of the solution to be used in a given case was determined entirely by whether or not the fibrous tissue element prevailed. In old, fibrous hemorrhoids stronger solutions were required.

When quinine and urea hydrochloride was first used as a local anesthetic, it was noted that the introduction into the skin or cellular tissue of a 1 or 2 per cent solution produced a marked fibrous edema which lasted several days. E. H. Tirrell, of Richmond, Va., when using this drug as a local anesthetic in ano-rectal operations, observed this reaction, and the thought occurred to him of utilizing this agent in the same manner as phenol had heretofore been employed in the treatment of hemorrhoids. It was found, however,

that to get this effect in a vascular tumor, a stronger solution, 5 to 10 per cent, was required, the weaker solutions, when injected into a hemorrhoid, being too weak for this purpose.

In 1916, Tirrell reported a series of 128 cases, in which he had injected a solution of quinine and urea hydrochloride into the pile tumor. The results in this series were quite remarkable, as the hemorrhoids and varicosities disappeared without any of the complications, such as sloughing and hemorrhage, that not infrequently followed the carbolic method. The agent itself has a peculiar and lasting anesthetic effect which renders it ideal for this purpose.

My own experience with quinine and urea hydrochloride has been most gratifying. While few cases are permanently cured nearly all get complete relief from bleeding and protrusions for periods varying from one to six years. The method is certainly the one to be preferred whenever an operation is out of the question, and it appears to be quite as effectual as the injection of carbolic solutions.

Although several hemorrhoids may be injected at one time, I have found it better practice to treat only one or two at the first visit, as certain patients are peculiarly susceptible to quinine in any form. If the hemorrhoidal tumors are outside the anal orifice, they should be reduced before treatment is begun. Strangulated hemorrhoids should never be injected, but a few days should be allowed to elapse until the acute symptoms have subsided. Strict asepsis should be observed. After the hemorrhoids are brought into view through a small, conical, fenestrated speculum, the needle is inserted in the center of the hemorrhoid to be treated and enough of the solution injected to distend it moderately (Fig. 46). A fine-pointed needle should be employed, inserted well into the body of the pile,

from 10 to 15 mm. of the solution injected, and the needle allowed to remain for a moment so that the solution will not escape at the point of puncture. At the next treatment, on digital examination the hemorrhoid is swollen and indurated. This induration usually lasts for ten days or two weeks and it is during this period that the bloodvessels of the hemorrhoidal tumor are obliterated, fibrous tissue taking

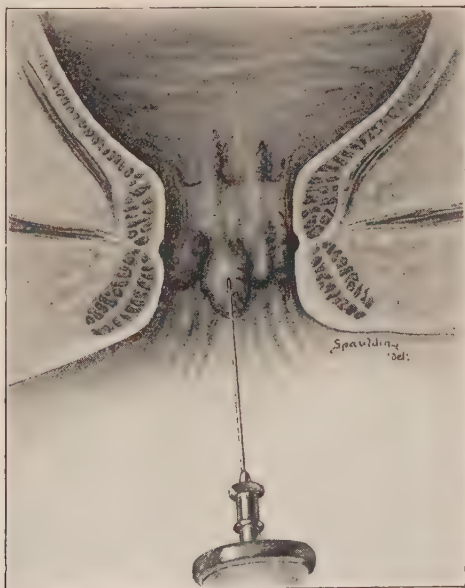


FIG. 46.—Injection treatment of hemorrhoids. Needle inserted in center of pile well above the cutaneous margin.

its place, causing them to shrink and almost entirely disappear. If, after two weeks, the hemorrhoidal tumor is still well marked, it should be reinjected, using this time a stronger solution, if the reaction at the first treatment did not appear to be very great.

The injection method is unsuitable for external hemorrhoids and for the internal pile in which the connective-tissue elements predominate, thus rendering it excessively hypertrophied and fibrous.

The technic of the quinine and urea injection method may be briefly summarized as follows:

1. Determine if the case be suitable for this method.
2. Place the patient in the right or left lateral semiprone position, according to the preference of the operator.
3. Thoroughly cleanse the anal region.
4. Insert the index finger and gently massage the sphincters, causing them to relax slightly.
5. Bringing the hemorrhoids into view by means of a speculum, inject from 10 to 15 minims (depending upon the size) of a 5 per cent solution of quinine and urea hydrochloride directly into the center of the pile at its upper extremity.
6. Inject only one or two piles at one time and use small rather than large quantities of the injection fluid.
7. These treatments are repeated at intervals of four to seven days.

To complete a cure in ordinary cases requires from three to a dozen or more treatments. Like other surgical procedures, a careful technic with much attention to detail and some little experience are required in order to get the most satisfactory results. At the present time, I employ this method in selected cases, more especially hemorrhagic cases, where it acts like a specific. Many patients will not submit to any operation, no matter how trivial, and for these quinine and urea hydrochloride injections is a real boon.

**Operative Treatment.**—1. *Choice of Surgical Operations.*—Though many operations have been, and are constantly being suggested for the cure of internal hemorrhoids, the

clamp and cautery, circular incision (Whitehead's operation) and ligature include all that have ever received any general recognition. Any of these procedures, if intelligently carried out, will prove universally successful.

2. *Preparation of the Patient.*—The preparation of the patient should be adapted to the case in hand. If either the clamp and cautery or ligature method is to be employed, a small enema of boric-acid solution, not exceeding 8 ounces, may be administered and the operation proceeded with at once, as this is sufficient to effectually clear out the ampulla of the rectum of any retained feces. A cathartic, or even a laxative, should never be ordered the night before, as this is sure to result in movements during or immediately following the operation.

However, when the bowels have been inactive for some time, and always when a Whitehead operation is contemplated, it is better thoroughly to clean out the intestines by giving a suitable amount of some laxative to secure four or five copious movements of the bowels the day preceding that fixed for operation. The patient can often best tell what form of laxative he can take with the least general disturbance. Pulv. glycyrrhizæ comp. 1 to 3 level teaspoonsful the last thing at night of the day preceding that fixed for operation seems to answer the purpose very well. Castor oil, ℥ss; Pil. cath. comp. (No. ii or iii) may be used in like manner. When the Whitehead operation is selected, it is better freely to relieve the bowels on three or four successive days prior to the operation.

In every case when the operation is settled upon in advance, a copious saline enema (2 to 3 pints) should be given three or four hours before the time appointed for operation. The patient should be told to void urine the last thing before

getting onto the operating table and should at the same time try to pass anything that remains in the rectum.

3. *Local Anesthesia*.—While formerly the use of local anesthetics for the radical treatment of hemorrhoids was limited to external skin-tabs, thrombotic piles, and simple cases of one or two prolapsing internal hemorrhoids, they are now very generally employed in this, as in other rectal affections. The peculiar advantages of local anesthesia for this operation are as follows:

(a) Some patients who have a dread of general anesthesia will accept operation when a local anesthetic can be employed.

(b) There is practically total elimination of discomfort to the patient, the nearest approach to any feeling of pain being the initial prick of the needle.

(c) The postoperative nausea and vomiting, and unpleasant sequelæ of general anesthesia, are avoided.

(d) In old people, cardiac cases, and other bad surgical risks, the dangers incident to general anesthesia are eliminated.

As a rule, hemorrhoids complicated with fissure, fistulæ, polypoid growths, etc., are unsuitable and should be subject to general anesthesia. Also hemorrhoids located so high up as never to protrude are sometimes very difficult to deal with under local anesthesia, especially in patients in whom it is difficult to expose the anal region, as, for instance, where there is a "funnel-shaped anus."

4. *Technic*.—The lower rectum is innervated chiefly from the sacral plexus. Most of the nerves distributed here, such as the inferior hemorrhoidal, perineal and cutaneous are branches given off by the pudic nerve after it has entered the ischio-rectal fossa. Blocking these nerves often proves unsuccessful, doubtless due to the fact that this region is still further supplied by certain nerves that come down through



the inguinal canal, as well as others which originate independently in the coccygeal plexus. Therefore, to produce the necessary anesthesia, the structures all about the anus, to a level well above the internal sphincter, should be infiltrated. This requires from 2 to 4 ounces of 0.5 per cent novocaine. My favorite formula, prepared immediately before the operation is as follows:

Novocaine . . . . .	grs. viii
Sterile salt solution . . . . .	3ii

Boil for thirty seconds then add:

Sterile salt solution . . . . .	.q.s. ad 3iv
Solution adrenalin chloride (1 to 1000) . . . . .	qtt x

I prefer a glass syringe holding 20 cc. In order that the anesthetic solution may be evenly distributed and come in direct contact with all the nerve fibers surrounding the lower 2 inches of the rectum, it is necessary to have a definite plan of procedure. With a fine needle a wheal is made 1 inch posterior to the anal orifice. Then with a larger needle (2 inches long) the posterior half of the anal circumference is infiltrated close up to the rectal wall for a depth of nearly 2 inches. One should aim to have a uniform, slow and steady flow of the solution. The sphincter muscles should be infiltrated, but caution should be exercised not to distend the field of operation, as such distention distorts the view of the hemorrhoids about to be removed. By a process of partial withdrawal and reinsertion of the needle only two skin punctures are required. The syringe is refilled by disconnecting it from the needle. The other point of entry should be anterior to the anus in order to complete the circuminjection. (Fig. 47.)

After completion of the infiltration, the sphincter muscles voluntarily relax and very little dilatation is necessary.

The operation then proceeds in the same manner as under general anesthesia. As always when operating under local anesthesia, unnecessary handling of the tissues should be avoided. A preliminary hypodermic of  $\frac{1}{4}$  grain of morphine is of benefit to improve the mental attitude of the patient, save time, and relieve the pain which sometimes occurs when the action of the anesthetic is wearing off.



FIG. 47.—Two points from which the whole perianal region can be anesthetized. From these two skin punctures the tissues are injected with a solution to a depth of 2 inches above the anal orifice.

**Whitehead's Operation.**—This operation, formerly very generally employed, aims to forestall the possibility of any recurrence by removing the whole pile-bearing area. In certain varicose conditions associated with a general prolapse of the mucous membrane, it is more effective than either the clamp and cautery or ligature operations. By excising *en masse* the redundant mucous membrane, all the

pathology is removed. It is, however, only in those cases in which the prolapse is the predominating feature that this operation has anything to commend it over the simpler methods of the ligature or cautery. Personally, I much prefer, in cases of this kind, removing the whole mass with the three needle operation described in the Chapter on "Prolapse," p. 185. It is every bit as radical a procedure and there is not the liability of slow and irregular healing.

The steps of the operation vary somewhat as advised by different surgeons, but as modifications are simply different ways of doing the same thing, they will suggest themselves in the course of the operation. The technic is, briefly, as follows:

Lithotomy position. Stretch sphincters. Attach five or six snaps at equal distances about the circumference of the prolapsed piles. Separate with scissors the mucous membrane from the skin at the muco-cutaneous juncture. As an assistant supports the forceps, the operator, by blunt dissection with scissors and fingers rapidly separates mucous membrane and imbedded tumors from the muscular wall of the anal canal high enough to enable the mass to be drawn down so that the pile-bearing zone may be excised and the healthy mucous membrane united to the skin. The cylinder of mucous membrane should now be cut through in the mid-line anteriorly and sutured at this point. By cutting away only about  $\frac{1}{2}$  inch at a time a continuous catgut suture may be used to unite the whole circumference of the gut, a method which assures a minimum loss of blood. It is seldom necessary to apply separate ligatures to bleeding vessels as the suture is generally sufficient. The bowels should be confined for six or seven days in order to secure primary union, if possible,

The disadvantages of the Whitehead operation are that it is an unnecessarily severe one for the majority of cases, that primary union is seldom secured, and that when the mucous membrane has not been accurately coapted irregular islets protrude and cause irritation.

**Ligature Operation.**—The patient is placed in the right semiprone position, since the greater number of hemorrhoids will usually be found on the right side, with the knees flexed on the abdomen. An assistant supports the left buttock with his right hand, leaving the left free to sponge and

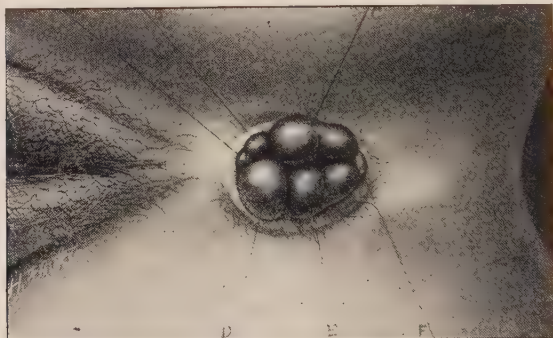


FIG. 48.—Internal hemorrhoids have a definite arrangement as regards the anal circumference. The three larger ones are always present in a fully-developed case. The three smaller ones are not often present. *A*, anterior hemorrhoid; *B*, left anterior hemorrhoid; *C*, left and right posterior hemorrhoids coalescing; *D*, right anterior hemorrhoid; *E*, right and left posterior hemorrhoids coalescing; *F*, small posterior hemorrhoid.

make traction on the pile forceps when the operator is applying the ligatures. Some surgeons prefer operating with the patient in the lithotomy position. The size and location of the external piles should be made out before beginning the operation, it being often difficult to estimate clearly the amount of tissue requiring removal after dilatation of the sphincters,

The first, and a very important step, is to dilate gently the sphincters with the forefingers of both hands always taking plenty of time—four or five minutes—and by a sort of massage process, exerting firm and continuous traction until they gradually dilate. The thumbs should never be used for divulsion, there being danger of exerting too much strength, perhaps tearing the muscle and thus producing permanent incontinence. Even with the fingers it is necessary that the operator have complete control over the force used. If, however, it is found that the external sphincter is unusually rigid and hypertrophied, it should be divided just to the right of the posterior median line. Failure to appreciate the indications for this procedure and its omission account for the painful sphincterismus which sometimes follows hemorrhoidal operations.

Divulsion completed, the subsequent steps in the operation are simple and certain, as the piles are plainly visible. The hemorrhoids are now operated on in rotation, beginning with the most anterior on the right side (Fig. 49). The others are taken in order, those on the lower side being first removed. By observing this order, the free oozing of blood which takes place upon separation of the hemorrhoid from the bowel will not obscure the field of operation, as it would were the superior ones first removed. Each tumor is now, in turn, seized with a pair of pile forceps, and while elevated the hemorrhoid is dissected upward until it is attached by a narrow pedicle which contains its main blood supply. While there is little danger of hemorrhage in this step of the operation, as the central artery and vein lie superficially under the mucous membrane, and the elevation of the hemorrhoid, as just described, precludes the probability of wounding any large vessel, should the bleeding be profuse and persistent traction may be made on the ligated pile and the bed from

which the pile was dissected closed with two or three catgut sutures, thus controlling all hemorrhage.

A strong, sterilized linen ligature is tied about the pedicle as high up as possible, the assistant making gentle traction to facilitate this step, and the hemorrhoid cut off below, leaving sufficient stump securely to retain the ligature.



FIG. 49.—Hemorrhoid has been seized with forceps, dissected well up into the anal canal and a ligature tied about the pedicle. Two catgut sutures unite the edges of the wound from which the hemorrhoid has been dissected when bleeding is inclined to be profuse.

In properly making the dissection just described, the success of the operation depends on two factors: the incision should include the external pile and mucous membrane and should be carried well up the bowel. All the mucous membrane of the anal canal should not be sacrificed, but an endeavor should be made to leave a narrow strip between the several



tumors, a procedure which will hasten the healing and obviate all possibility of stricture as an after-result. When two piles are coalesced, however, they may be removed as one tumor by a double ligature. At least two or three bridges of mucous membrane should be left, connecting the skin at the anal margin with the mucous membrane of the rectum

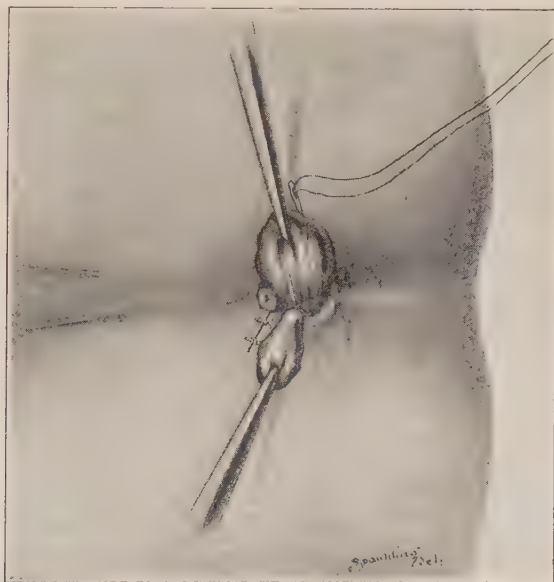


FIG. 50.—Method of removing large, double coalescing hemorrhoids by means of a double ligature. A single ligature about a pedicle does not cut through rapidly enough and is apt to be followed by a secondary hemorrhage due to the ligature not completely cutting through.

above (Figs. 50 and 51) in the completed operation. If these simple points were always borne in mind the unusual suffering of long-continued ulceration, often followed by stricture, as sequelæ of either the ligature or the clamp and cautery methods of curing hemorrhoids would be much less frequent.

The internal hemorrhoids now having been removed we may deal with any external ones as described on page 147 if local anesthesia is used.

After ligation of all the internal hemorrhoids, any folds of anal skin that are clearly redundant should be removed, for if these ragged tags are allowed to remain, they become

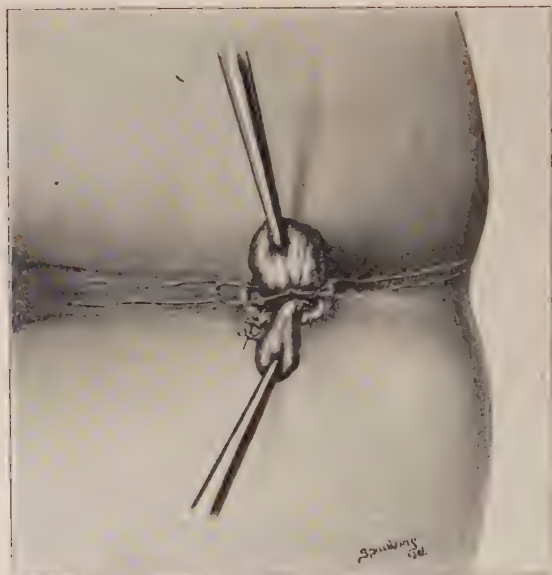


FIG. 51.—Method of removing large, double coalescing hemorrhoids by means of a double ligature.

painfully edematous because of the patient's inability properly to cleanse the anal region after defecation. The persistent fecal soiling often causes pruritus in those predisposed to it, and, when inflamed, the redundant folds are excessively painful, rendering walking and sitting difficult.

If the base of the external hemorrhoid is quite broad, it is best to unite the edges with a catgut suture. When

the folds are very numerous, not more than three should be removed at one time, lest anal contraction take place.

It is always well to remember that in the majority of cases of internal hemorrhoids, even if there are no well-marked



FIG. 52.—Prolapsing internal hemorrhoid with redundant skin that should be excised to prevent edema following the operation.

“skin tabs,” there is more or less redundancy of the anal skin; for this reason, two or three elliptical pieces of skin should be excised, which serves the double purpose of preventing edema of the parts (often the source of much distress immediately following the operation) and preventing the

formation of external hemorrhoids, which are left after subsidence of the inflammation of the redundant skin.

**Clamp and Caustery Operation.**—In describing the technic of this operation it is unnecessary to repeat much that was

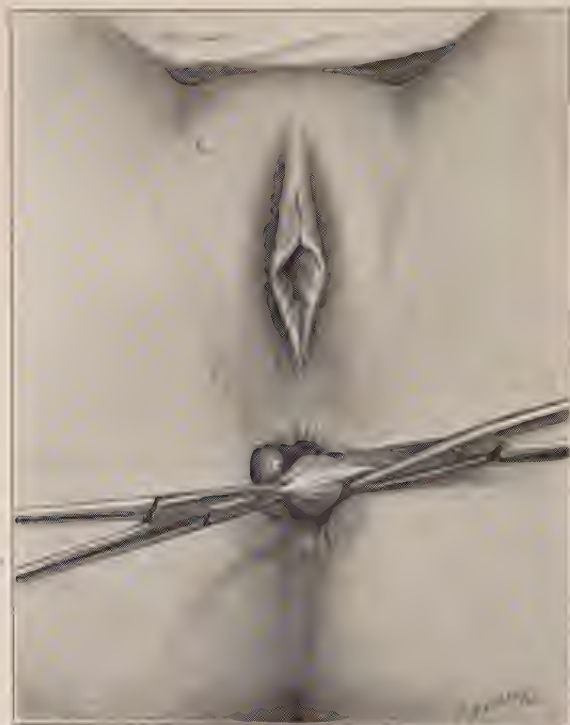


FIG. 53.—Dissection of hemorrhoids. Skin removed in same quadrant of the hemorrhoid to prevent skin tabs.

said of the ligature method, the two operations being nearly identical except as to the manner of treating the pile stumps, which is by ligature in one case and with a clamp and red-hot iron in the other.

I prefer the lithotomy position the patient's legs being fixed or held by assistants. The sphincters are thoroughly divulsed, as previously described, and the hemorrhoids being exposed, each in turn is seized with a pair of hemostats.

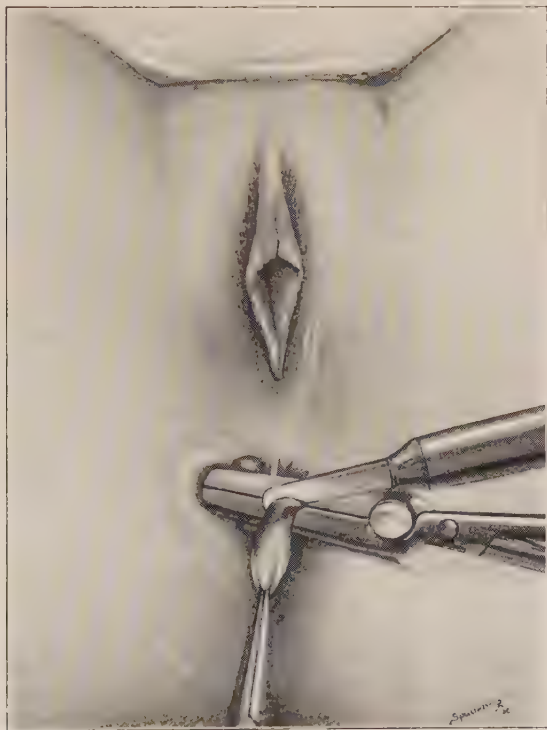


FIG. 54.—Clamp and cautery operation. Note hemorrhoid has been dissected free and the pedicle alone is being cauterized.

When they have been secured, all snaps with the exception of the one being dealt with, are handed over to be supported by an assistant. By securing them before beginning the operation, should any of them slip out of view, the manipulations required to again seize them, perchance laying open the

charred stump of a pile already treated, thus causing bleeding which may be difficult to control, are avoided. Each pile is now, in turn, dissected from its submucous attachments, as already described, and a pile clamp tightly adjusted about the pedicle of the detached pile. Numerous clamps have been devised according to the several notions of many different surgeons who rely upon this operation for hemorrhoids, but the Kelsey clamp is quite as satisfactory as any.

The hemorrhoid is now cut away and the whole raw stump thoroughly seared with a Paquelin or iron cautery, at a dull red heat. The clamp is then slowly loosened and if any bleeding points are observed, it should again be tightened and the cautery applied until all tendency to bleed has subsided. All the hemorrhoids should be treated in this way and small varicosities that might lead to pile tumors should be lightly cauterized. Redundant anal skin and external piles are trimmed away as after the ligature operation.

**After-treatment.**—(a) *After-dressings for Ligature and Clamp and Cautery Operations.*—The author has never found it necessary to plug the rectum with tubes or gauze to prevent hemorrhage and allow the escape of flatus, as is recommended in many text-books, but believes that much uncalled for suffering is occasioned by their use. If the hemorrhage has been properly controlled at the time of operation, these plugs are unnecessary. A hemorrhoid operation should never be considered completed until anything more than a slight oozing has been arrested. A V-shaped pad of sterile gauze should be placed over the anal orifice, and on top of this several layers of gauze. A cotton-flannel T-bandage makes firm pressure over the seat of the operation.

During the first few hours following operation this pad and the pressure applied will prove very gratifying to the patient. At the end of five or six hours, however, the



patient's greatest comfort is secured if the pad is removed and a smaller piece of fluffy gauze applied instead, and the bandage tied more loosely. Patients should be instructed to pass flatus whenever they feel so inclined; otherwise they are liable to cause themselves much distress by controlling the desire through fear of doing themselves some injury.

(b) *After-treatment and Complications.*—These are identical in either the clamp and cautery or ligature operation and the following is therefore applicable to both.

A hypodermic of  $\frac{1}{6}$  gr. of morphine and  $\frac{1}{100}$  gr. of atropine should be given a half-hour before the administration of the anesthetic; this may be all that is necessary in the post-operative treatment to relieve pain, and it is nearly always sufficient to control the dejections as well. The administration of opiates for several days following hemorrhoidal operations to prevent the bowels acting too soon is an old-fashioned fad. Should they move immediately after the ligature operation, no harm would be done, but after the clamp and cautery it is preferable that they be confined for twenty-four hours at least, because of the greater danger of hemorrhage following the passage of a formed stool. It has been my experience that bowel movements after hemorrhoidal operations, without the administration of a laxative, are of the rarest occurrence, the reason for this being that, through fear of causing himself pain or bringing on hemorrhage, the patient will, without much effort, effectually overcome any desire to defecate. After the clamp and cautery, should an inclination to stool occur within the first thirty-six hours, it may be controlled with tincture opii, gtts x, repeated in a half-hour if required.

In ordinary cases the treatment after the first twenty-four hours is simple and the patient will doubtless make a satisfactory recovery if the anal region is kept clean and the bowels

relieved daily by a suitable aperient, if necessary. When an operation is performed at the home of the patient, a trained nurse should always be left in charge, when the clamp and cautery operation has been elected, because of the greater danger of hemorrhage should the bowels move unexpectedly. After this operation the nurse should be instructed, should there be an uncontrollable desire, to inject 4 ounces of linseed oil before permitting the use of the closet. On the other hand, after the ligature operation there is little likelihood of hemorrhage even though a large stool of firm consistency should be passed, however unexpectedly.

(c) *Local Treatment After Operation.*—Nearly all the discomfort following this operation can be allayed and the healing process hastened by attention to the details of cleansing the anal orifice and canal during the first ten days following operation. The anal orifice should be gently but thoroughly cleansed by wiping away any dried blood or secretions that may be present. This should be done at least two or three times a day. Should there be a smarting, burning sensation not relieved by this process, a little 10 per cent boric-acid ointment may be applied just within the anus. Balsam of Peru or ichthyol in castor oil may be used satisfactorily in the same manner, the oil forming a stiff protective dressing of a lubricant nature which is especially adapted for application to the canal.

A smarting pain coming on immediately after a defecation is generally due to small fecal particles lodged in the wound higher up and to relieve this a small enema (8 ounces) of boric-acid solution should be thrown into the rectum and the patient allowed to get up and immediately pass out the solution, in this way removing the source of irritation.

During the first two or three days the levator ani muscle will sometimes contract spasmodically at intervals, giving

the seat of operation a sudden jerk. This is best relieved by placing a hot, moist compress over the anal region and tightening the bandage, in this way suspending and putting the muscle at rest. A hot-water bag placed over this, or over the sacral region, will afford added relief.

(d) *Urinary Difficulties.*--Retention of urine is one of the complications that occasionally follow rectal operations, but if the following simple directions are remembered, it will be necessary to resort to catheterization only on the rarest occasions. If the catheter is used once, it will probably have to be continued for several days. To prevent this complication the patient should urinate immediately before the operation, and should be cautioned, as he recovers from the anesthetic, that if he will control any desire to micturate, it will soon pass away. If several ineffectual attempts are made, catheterization will almost certainly be needed. At the end of twelve hours male patients may be permitted to stand up and use the urinal; or, if female, to sit upon the commode. If the urine cannot be passed naturally at this time, attempts at micturition should be postponed for three or four hours, when the difficulty previously experienced will have disappeared. It is even better to limit the amount of fluids and to wait at least twenty-four hours before resorting to the catheter. Before using the catheter male patients should resort to the bathroom and place the penis in a glass of hot water. The psychological effect of listening to running water may be utilized at the same time. For women hot cloths placed over the pubic region, or a sitz bath, may be ordered.

(e) *Diet.*--The diet after a hemorrhoidal operation is not a topic of any special importance. After the patient has sufficiently recovered from the anesthetic, any ordinary articles of diet to which he is accustomed may be allowed.

I believe that the liquid diet advocated by many with the object of diminishing the fecal residue is of doubtful efficacy and deprives some of these patients, weak and debilitated from rectal hemorrhages, from nourishing food, thus materially retarding convalescence. A liquid diet continued for some time will often cause an accumulation of intestinal gas which is very troublesome.

(f) *Hemorrhage*.—If all hemorrhage has been arrested at the time of operation, it is a most unusual occurrence for anything to take place more than an oozing which is easily controlled by pressure. If, however, the operation has been carelessly performed, hemorrhage may take place within a few hours. This is always due to faulty technic, such as the ligature not being securely tied, or to some large spurting vessel overlooked.

Secondary hemorrhage ordinarily takes place from the sixth or seventh to the tenth day, and as a general proposition, it may be stated that hemorrhages of this kind are due to a separation of a slough or to ulceration over the seat of an excised hemorrhoid when the clamp and cautery operation has been employed. In the ligature operation, I am satisfied that they are always caused by the strangulation of too much tissue in a single ligature. If it is impossible to leave a narrow pedicle after the dissection of a hemorrhoid, it is always advisable to pass a double ligature through the pedicle, ligating the two portions. Personally, I am convinced that nearly every secondary hemorrhage is due to this cause, for in those I have seen the ligatures have not cut their way through, but have left a portion of the pile still viable. Ulceration takes place around the ligature and most alarming hemorrhages sometimes occur.

Severe recurrent or secondary hemorrhage is manifested by the same symptoms as are noted in concealed bleeding

in other portions of the body -unusual pallor, cold perspiration, an anxious expression of the face, sighing respiration, cold extremities, feeble and rapid pulse in conjunction with colicky pain in the lower abdomen and a desire to defecate. It is a wise precaution to tell the nurse to be on guard for any one of these symptoms and, if present, they should be immediately investigated. When such a hemorrhage has taken place, if the external dressings are removed and the patient instructed to strain down, a gush of dark-colored clotted blood will usually follow. Sometimes, however, it is necessary for the surgeon to introduce the finger, when he may feel a soft mass of clotted blood and this, being broken up, will immediately escape on withdrawal of the finger.

The treatment of these internal hemorrhages requires active measures. In the majority of cases I believe it is the best plan to anesthetize the patient at once, and secure the bleeding vessel. Very often this is a difficult thing to do, and if the place from which the bleeding emanates is not at once apparent, rather than to waste time searching for a vessel that has retracted up the rectum, it is best to arrest the hemorrhage by compressing the tissues in the immediate vicinity from which the bleeding is taking place with two or three catgut sutures. Other measures, as a rule, are makeshifts. If the rectum is packed full of gauze through a speculum, hemorrhage may be arrested in this way, but it is a most uncomfortable procedure and one which many will not endure. Occasionally, without ether when the sphincters are rather relaxed the source of the hemorrhage can be discovered with a retracting speculum and the spurring vessel ligated, or direct pressure made upon it.

(g) *Edema of the Anal Skin.* Very often after the bowels move for the first time, one or two edematous swellings will be found at the anal margin. They occur in those patients



who have a redundancy of the anal skin, and if just the correct amount were excised at the time of operation, these swellings would seldom appear. Ordinarily, they slowly disappear; but if, at the end of three weeks, they have not subsided to insignificant dimensions, they should be snipped away under the influence of local anesthesia. They sometimes occasion needless alarm if the patient becomes aware of their presence and he should be assured of the nature of the tumors and that they are not a return of hemorrhoids.

(h) *Stricture of the Anal Canal*.—Occasionally there is considerable narrowing of the anal canal, due to too free a removal of the hemorrhoids, or to the parts adhering during the healing process. A stricture of this kind can readily be overcome by inserting the finger a week or ten days after the operation. If no constriction is then found to have occurred, it is exceeding unlikely that it will take place later. But if there is a tendency to stricture, dilatation with the finger should be instituted immediately at intervals of four or five days, for two or three weeks, when the stricture will be found to have disappeared. If this procedure excites considerable pain, a pledget of cotton dipped in 10 per cent cocaine should first be inserted in the anal canal.

It is a good rule for every surgeon who does a hemorrhoid operation to make a digital examination before discharging his patient. I have operated on several distressing cases of tight stricture that I feel sure could have been avoided if this rule had been followed.

*Abscesses, fistulæ and infective ulcerations* have now become such rare complications that they do not deserve any consideration in this connection. Their causes and treatment are considered under separate chapters.



## CHAPTER X.

### PROLAPSE OF THE RECTUM.

**Definition.**—Prolapse, in its broadest sense, may be said to be a protrusion of the rectum outside the anus, but this may indicate two distinctly different conditions, depending, to a large extent, on the degree of prolapse. There may be protrusion of the mucous membrane alone, or the mucous membrane may maintain its relationship with the other coats of the bowel, constituting a complete prolapse. While protrusion of the mucous membrane is not uncommon, especially in children and old people, true procidentia recti is rare. Studying the literature, one is immediately impressed with the paucity of cases published, most authors reporting only one or two, even though they are men of very wide experience with an enormous amount of clinical material at their disposal.

#### MUCOUS MEMBRANE PROLAPSE.

**Symptoms, Diagnosis and Causative Factors.**—While this condition occurs at any age, it is, as noted above, particularly frequent in children. This may partially be accounted for by the peculiar anatomy of the pelvis in children and the relation of the pelvic organs to the rectum; for we find in the young a particularly straight pelvis and consequently greater intra-abdominal pressure from the pelvic organs.

According to Todd, section of the pelvis at birth shows that the position of the rectum in relation to that of the

bladder and uterus differs from that in the adult in that the latter organs are higher. That is, at birth the rectum is at a disadvantage because it is lower in relation to the other organs, which, later in life, descend into the pelvis. The rectum occupies the same position in relation to the vertebræ as in the adult, but is at a disadvantage mechanically from the higher position occupied by the bladder and uterus, as well as because of the straight character of the sacrum, by reason of which the organ is not relieved from pressure of overlying viscera as it is by the more curved sacrum of the adult.

This author finds no greater laxity of the recto-sacral attachments in the infant than in the adult. In both there is sufficient play in the rectal stalks to allow a certain limited prolapse in the presence of other accessory causative factors and without damage to the nerves and vessels themselves. In such instances the prolapse must obviously be temporary, and it would appear unnecessary to resort to operative measures for its treatment.

Differential diagnosis of the form of prolapse is simple, for on asking the patient to strain, the protrusion is brought outside the rectum. If it is a mucous membrane prolapse, the folds will be found to be longitudinal, radiating from the center to the circumference, the opening circular and patulous; while in complete procidentia the folds are circular, the orifice slit-like and drawn backward by the attachment of the meso-rectum, or in females, forward by the closer attachment of the vagina. Moreover, 2 inches is about the extreme length of a mucous membrane prolapse.

Practically all cases of procidentia are the result of neglect or improper treatment of what was in the beginning a simple form of mucous membrane prolapse. The mucosa is attached to the muscular wall of the rectum by a loose network of

cellular tissue, which normally permits a certain degree of mobility of one coat upon the other. If this mobility become exaggerated (whether from a general laxity of the tissues, loss of tone of the sphincters, or the absence of fat in the ischio-rectal fossæ), an eversion of mucous membrane takes place. If treatment is not instituted at this stage, the next step may be a slipping out of all the coats of the rectum.

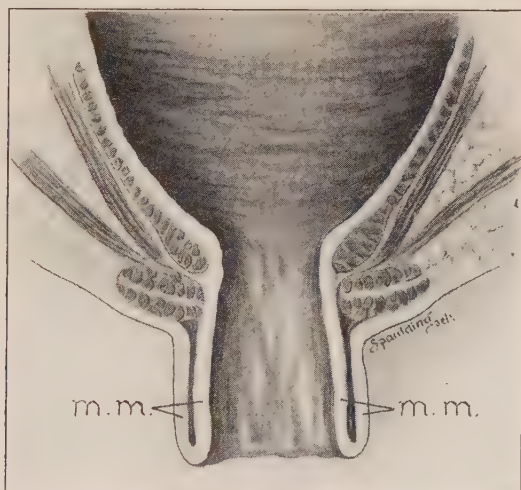


FIG. 55.—Diagrammatic drawing of mucous membrane prolapse. The protrusion is made up chiefly of mucous membrane, *M. M.* When the muscular wall of the rectum is included in the protruded mass we have a procidentia recti (see Fig. 57).

Some predisposing factors frequently mentioned are hemorrhoids, polypi and tumors, growths which tend to draw down the mucous membrane. The sphincters are weakened from continual straining which, in turn, may be due to constipation, dysentery, and especially in children, pin-worms. Many other conditions put a strain on the normal resistant power of the supporting structures of the

rectum, such as the intra-abdominal pressure produced by coughing in pulmonary affections. Several cases reported in the literature have followed too free a division of the sphincter after fistula operations. Traumatism following operations for rectal troubles, such as deep fistulæ, which leave the anal aperture wide open, are followed by prolapse. Other contributory causes may be stricture of the urethra, enlarged prostate, or edema of the pelvic tissues from pregnancy.

**Treatment.**—At first the prolapse is easily reducible, but as the amount of prolapsed membrane increases, reduction becomes more and more difficult. In children operation is seldom necessary, cure being effected by removal of the underlying cause. Easy movements should be procured by the use of laxatives, especially liquid petrolatum or enemata and the pin-worms, polypi, or other accessory factor, should receive appropriate treatment. If necessary, the gluteal region may be strapped with adhesive plaster.

Mucous membrane prolapse is frequently seen in middle life and among elderly people it is often their chief infirmity. I believe it is a great mistake to advise any of these patients, even the decrepit and aged, to be satisfied with palliative treatment, which never, at the best, affords much relief, when a safe operation can easily be performed under local anesthesia. Several of my patients have been over eighty years of age and would have been considered poor surgical risks had general anesthesia been required, but without exception they made quite as rapid recoveries as do much younger subjects. The importance of relieving the easily remedied defects of old age cannot be overestimated. Many of these neglected cases of rectal prolapse become practically confined to the bed, or at least must assume the recumbent position the greater part of the time on account of the protrusion which recurs when standing or walking about. Such

inactivity is a severe tax upon vitality and the removal of its cause will inevitably prolong life.

Various procedures have been recommended and are used in the treatment of this condition. Cauterization by application of nitric acid or by linear burning with Paquelin is unreliable and, therefore, should not be employed. The removal of elliptical strips of the redundant mucous membrane with the clamp and cautery will often give satisfactory results, but it does not remove all of the pathological conditions. Then, too, there are technical difficulties, as the clamp is a clumsy instrument to use without thorough division of the sphincters which is distinctly harmful in this class of cases. Moreover, the realization that a red-hot iron is being used distresses nervous patients unless done under full surgical anesthesia.

Whitehead's operation is essentially a circular excision of the prolapse, followed by suturing the mucous membrane to the skin at the anal margin. My objections to this method are the loss of blood attending it, the length of time consumed, and the slow and irregular healing which often ensues.

The following operation I have found best adapted for cases of prolapsus ani. The main features of this method were first advocated and practiced by the late Mr. Goodsall,<sup>1</sup> at St. Mark's Hospital for Diseases of the Rectum, London, England. With certain modifications, I have now employed it with entire satisfaction for many years. Mr. Goodsall did not incise the mucous membrane at the muco-cutaneous junction, nor did he excise the prolapse. He applied the ligature in the ingenious manner I shall presently describe, after which he recommended that "as soon as all the ligatures have been tied, the strangulated parts should be returned

<sup>1</sup> Goodsall and Miles: Diseases of Anus and Rectum, Pt. II, p. 14.

into the rectum and kept in position by a plug of cotton wool soaked in 20 per cent solution of cocaine." On the other hand, my practice has always been, first, to separate the mucous membrane from the skin with a shallow incision, which renders the operation less painful. Then, after the ligatures have been tied, I cut away the fold of mucous membrane so that it is quite unnecessary to plug the rectum.

The patient should be in the right semiprone position, with an assistant to support the buttock, or in the lithotomy position. Personally, I have accustomed myself to operate with patients in the former position, as I think it is easier for them, both physically and mentally. Local anesthesia is administered as described in the chapter on Hemorrhoids, page 160.

Anesthesia having been accomplished, the mass, if not already protruded, is brought down by digital manipulation. The prolapsed fold of the right side is now slowly elevated with a couple of hemostats, and an incision made with scissors at the muco-cutaneous juncture, about  $\frac{1}{4}$  inch deep. While making moderate traction in a downward direction, the three curved needles, which have been previously threaded on a linen ligature 1 yard long, are passed in at the line of incision and brought out at the upper part of the prolapse in the following manner (Fig. 56): The middle needle is first passed in the center, and the other two needles are inserted on either side of the middle one, thus dividing the fold into four equal portions. The four loops are now identified, the needles cut off, and each loop in turn tied very tightly. In this way the entire fold is completely strangulated, and as the ligatures are not interlocked, there is no occlusion of the anal canal. The operation is completed by excising a goodly portion of the mucous membrane below the ligatures, care being taken to leave enough so that they



will not slip off. When the prolapse is bilateral, the same procedure is carried out on the other side. It not infre-

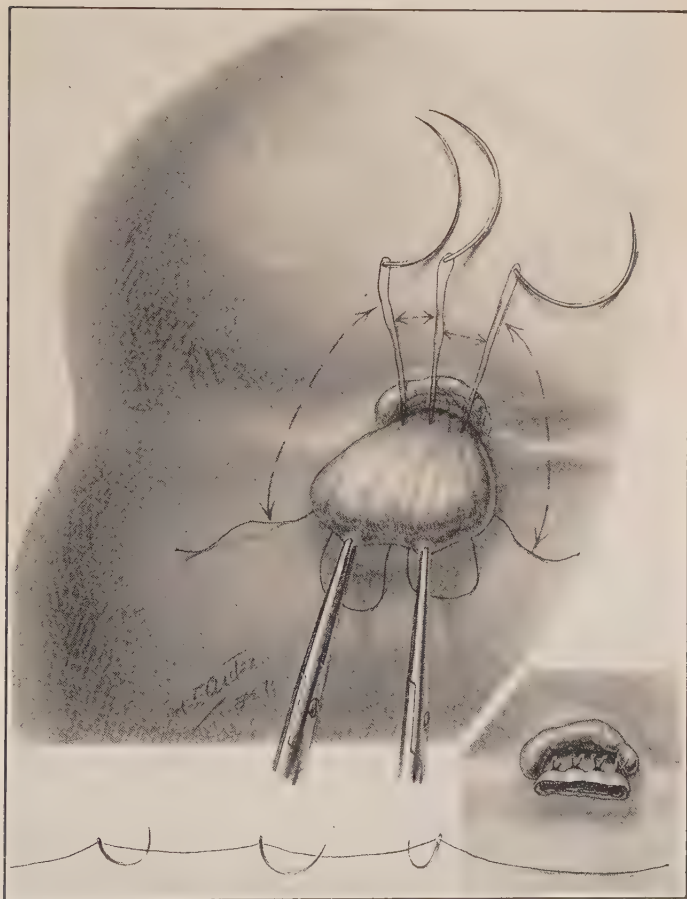


FIG. 56.—Three-needle method of removing a mucous membrane prolapse.

quently happens that the fold on one side is much smaller than the other. In such instances one, two, or three loops

and, therefore, fewer needles, according to the size of the prolapse, will be found sufficient.

*After-treatment.*—The bowels are moved on the second day after operation and daily thereafter with some mild aperient or cathartic. The anal region should be carefully cleansed three times daily by an experienced nurse and protected from external infection by a fluffy pad of sterile gauze. The average patient may expect to resume the activities of his normal life in a week or ten days.

*Advantages of this Operation.*—(a) It can be painlessly performed under local anesthesia, an important consideration in the aged and debilitated.

(b) It is a short operation.

(c) There is absence of hemorrhage.

(d) The end-results are always satisfactory, and a recurrence is practically impossible.

(e) This method of applying the ligatures brings about a more normal repair than any other operation; in fact, it is often impossible, after an interval of three or four months, to determine whether any operation has been performed.

### COMPLETE PROLAPSE.

**Symptoms and Diagnosis.**—Usually the protrusion will be found to have been of long standing, having been at first easily reducible through voluntary action of the levator ani, but becoming, in the course of time, reducible only manually. Occasionally the prolapsed rectum becomes strangulated and irreducible resulting in gangrene or ulceration, or there may even be protrusion of small intestine. These cases are, of course, very serious and the only operative measure indicated under these circumstances is excision, which is especially dangerous at such a time because of the fact that

the peritoneal cavity has to be opened and infection is liable to follow. In every case of prolapse excessive mucous secretion makes it necessary for the patient to wear an anal pad of some kind, and frequently when there is ulceration, there is discharge of pus and blood.

Inspection reveals a mass protruding from the anus, of inverted cone shape, hardly ever exceeding 5 or 6 inches in length, its surface covered with mucous membrane which varies in appearance from normal to an inflamed, thickened, or ulcerated mucosa. Upon the apex of the protrusion there is an opening, which is central when the prolapse does not exceed 3 or 4 inches. When it exceeds this amount, the orifice is directed backward by the traction of the mesorectum. According to Moschcowitz, the anterior half frequently gives a tympanitic note on percussion because it is usually filled by small intestine; the posterior half is dull on percussion.

In those cases which start as a mucous membrane prolapse (as I believe the majority do), there is a great redundancy of the mucous membrane at the anal margin. Frequently it is possible to take up with the fingers large folds of it with its submucous structures, and the muscular wall of the rectum can be felt beneath. This exaggerated redundancy is of much importance when we consider the operative treatment, for I believe that in those instances in which this feature is very marked, plastic operations aimed at narrowing the anus are all that are indicated, and in the great majority of cases will result in a permanent cure. In cases where this marked redundancy is not present this type of operation could not be undertaken with the same hope of radical cure.

**Anatomy.**—Because of the very numerous and widely diverging views as to the etiology of complete rectal prolapse,

an understanding of the different points of the anatomy upon which these various views are based is essential.

The rectum is normally a fixed organ. There is, however, at the larger Houston valve and at the recto-sigmoidal juncture some mobility, although relatively this is very slight. The ampulla of the rectum, which extends from the recto-sigmoidal juncture to the level of the levator ani, is a rather

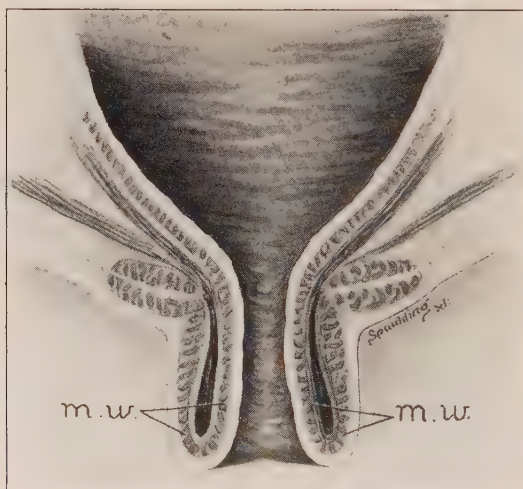


FIG. 57.—Diagrammatic drawing of a complete prolapse of the rectum. Procidentia recti. Note muscular wall, *M.W.*, of the rectum is also included.

large cavity, 4 or 5 inches in circumference. The surrounding musculature of the lower 2 inches, known as the anal canal, is rather dense, being composed of the external and internal sphincters and the levator ani muscles. This portion, in a natural state, is constricted to a very small diameter, though capable of voluntary and involuntary dilatation which permits the passage of large fecal masses at times.

The natural anatomical supports of the rectum which in health prevent a prolapse may be briefly summarized as follows: beginning from below, the external sphincter, and levator ani tightly close the anal orifice. The levator ani, otherwise known as the pelvic diaphragm, has a very important function in supporting the rectum, as well as the other pelvic organs. In any case of prolapse it naturally follows that these muscles must be greatly deficient and relaxed before a descent of the organ can take place. Whether their relaxation is cause or effect is rather difficult to state positively, but the fact that the majority of cases of prolapse of the rectum begin as an eversion of the mucous membrane suggests some loss of tone of these muscles as being the exciting cause.

Above the levator ani there are supporting attachments to the lateral walls of the rectum analogous to the broad ligaments which support the uterus. These play an important role in sustaining the middle portion of the rectum with its blood supply. The lateral ligaments are attached at the level of the third or fourth sacral vertebræ, and are below the peritoneum. Posteriorly, the rectum is rather loosely attached to the hollow of the sacrum by loose connective tissue, termed by Smith the "recto-sacral aponeurosis." It forms one of the layers of the viscero-pelvic fascia. This has the effect of holding the rectum in place, but is easily broken down by the finger when separating the posterior rectal wall from the sacrum, as in the operation for excision of the rectum. The lateral ligaments are the chief support of the rectum and have much to do with retaining this organ in its natural position, but the peritoneum must also be taken into consideration, because after freeing the lower rectum by division of the levator ani muscle, the rectum cannot be drawn down to any great extent until

these ligaments and the peritoneum have been divided, after which it comes down very easily.

The coccyx is another natural and firm rectal support. The flexed tip of this bone is well under the major portion of the rectum and is the most important bony structure supporting it.

An anatomical defect which of late has been receiving more and more attention is the abnormal depth of the cul-de-sac of Douglas in certain patients. This fact was noted as far back as 1890 by one or two writers, but received little attention until the recent writings of Quénu, Moschcowitz, Jones, and others. Today many surgeons have come to believe that every case of prolapse of the rectum is due to this cause. The supporters of the cul-de-sac of Douglas theory believe *procidentia recti* to be a perfect example of a "sliding hernia."

Jones gives the anatomy of this cul-de-sac as follows: "The normal pelvis in the male shows a posterior cul-de-sac which reaches to the second or third sacral vertebræ. In multiparæ the depth of the cul-de-sac is on a level with the posterior portion of the vaginal vault. In males it reaches just about to the top of the seminal vesicles (Zukerkandl). The transversalis fascia, which lines the abdominal cavity, is continued into the pelvic fascia where it gives support to the pelvic organs (*and is rather an indifferent structure*).<sup>1</sup> The posterior portion of the fascia is deeper than the anterior and passes downward and inward to the rectal wall to which it is intimately attached. Posterior to the rectum it covers the pyriformis and is continuous above with the anterior lamella of the lumbar fascia. It is this fascia, we believe, which limits the depth of the posterior cul-de-sac. It is this fascia, called by various names in different parts of the abdomen,

<sup>1</sup> The words in brackets are inserted by the author.



which has particularly to do with hernia, according to Moschcowitz's view. It is behind all vessels and there is a more or less funnel-shaped prolongation onto every vessel and every organ leaving the abdomen or pelvis. It is this fascia which supports the pelvic organs and the floor of the posterior cul-de-sac. It is a defect in this fascia (*which, at best, is poor*) the absence of it, or the stretching of it which is responsible for the extension of the cul-de-sac downward to the levator muscles." (*However, one must not overlook the influence of the neuromuscular function as a causative factor in the production of hernia.*)

"Zuckerkandl, Freund, and others have shown that this cul-de-sac normally extends to the levators in the fetus and that the depth is gradually decreased from this time to puberty, when it reaches to the level of the second or third sacral vertebræ. Moschcowitz believes that the fascia is normally attached to the rectum by a funnel-shaped extension downward onto it. A defect in this attachment allows the intestines to push downward along the rectum to the levators. The defect, he believes, to be congenital but the sac or deep cul-de-sac is acquired."

**Etiology.**—While the many factors which produce intra-abdominal pressure are all contributory causes, the etiological points upon which the many methods devised for its treatment are founded may be classified under five headings:

- (a) Inflammation of the mucous membrane.
- (b) Insufficiency of the pelvic floor.
- (c) Insufficiency of the natural supports of the rectum.
- (d) The structure of Douglas' cul-de-sac.
- (e) Loss of muscular tone.

The multiplicity of theories justifies the conclusion which I have long held that no one factor is entirely responsible,

but that it is a sequential process establishing a vicious circle.

Inflammation of the mucous membrane is the oldest theory of the pathogeny of prolapse and was based on the supposition that the inflammation or catarrh, starting with the mucous membrane, spread to the other coats, ultimately involving even the supporting structures of the rectum. It is a very difficult matter to understand how great a factor inflammation really is in producing a prolapse of the rectum. In many instances the mucous membrane of a complete prolapse has every appearance of being fairly normal and it is only in the later stages, when infection takes place, that ulcerations and erosions are manifest. On the other hand, it may be (as I have witnessed in one case) that an acute congestion of the liver causes so much tenesmus and straining that all of the rectal supports are overstretched rather suddenly.

The case referred to had a dysenteric attack following an alcoholic debauch and during the straining and vomiting which followed, the whole rectum was protruded for 3 or 4 inches. It was a complete procidentia in every respect—so much so that immediate operation was advised, but was delayed on account of the alcoholic state of the patient. Under palliative treatment, strapping the buttocks, etc., the rectum was held in place and, much to my surprise, there has never been any further recurrence during a period of eight or nine years. In this instance evidently the muscle tone was entirely recovered, by rest and support, after the inflammatory conditions had subsided.

The numerous operative measures aimed at strengthening the natural supports of the rectum may be divided into those which attack the problem from the point of view of loss of tone of the sphincters and levator ani, and, on the other hand,

those which have to do with the higher bowel, at the level of the sigmoid flexure or other point, as being at fault in the etiology of prolapse.

In the former group may also be put the many non-operative methods of restoring tone to the muscles and narrowing the anal orifice, such as massage, submucous injections of astringents, the use of mechanical supports, electricity and medication. All these measures are, of course, helpful, but it is questionable whether they get at the root of the matter.

**Operative Treatment.**—The literature on the subject fairly teems with descriptions of operations for the cure of procidentia recti. It would almost seem that every type of procedure imaginable has been advocated at some time or other. The results reported leave no doubt that the method advocated was eminently satisfactory in the particular circumstances in which it was employed, but the same method under slightly different conditions may prove very disappointing. This confusion as to the type of operation best suited to the case in hand arises, first, from the paucity of rectal prolapses that fall within the experience of any one surgeon and his consequent inability to suit his operation to the case in question; and second, from failure to carry out an operation as described, in all its essential details. In order to operate successfully for procidentia recti, every case must be considered on its own merits, and whereas any of two or three different methods may effect a cure, which ever one is adopted must be intelligently carried out with a full understanding of the factors which produced the prolapse. My purpose in going rather minutely into the anatomy of the subject was that the surgeon might be enabled to adapt his operation to the case in hand.

I believe that it will be more instructive to describe three

or four operations which have been rather universally accepted than to include many others which are merely modifications of these and the special features of which will occur to the surgeon during the course of his operation. It seems to be the custom of each writer to adhere to one particular type of operation, whereas in many instances to accomplish a perfect anatomical cure, one or more procedures may be required. For example, the so-called Quénu-Moschcowitz operation of obliterating the cul-de-sac of Douglas may relieve all the symptoms of a given case and prevent protrusion of the rectum outside the anus, although there may still persist a certain mobility of the lower rectum. A complete cure in such instances no doubt could be accomplished by a supplementary operation on the lower rectum, but as the patient is relieved of all his symptoms, he is satisfied with results. In the same way, an operation on the lower rectum prevents an extrusion of the gut, though there may be a certain degree of mobility or invagination of the upper rectum, which might be entirely relieved by an operation from above.

**Author's Operation.**—From a personal experience with 18 cases, the results of which, in all but 1 case, were successful from the point of view of the patient, and several of which were anatomical cures, I am convinced that in the great majority of prolapses an operation at the anal orifice should be the one first attempted. The operation which I have practised aims to support the upper rectum by a method of linear cauterization and at the same time prevent the prolapse by narrowing the anal canal.

There is no doubt that a small percentage of complete prolapses of the rectum were cured by the old operation of linear cauterization, which sets up adhesions between the rectal wall and the sacrum. Recognizing this fact, I begin

the operation by pulling out the rectum to its full extent, where it is held by two tenacula (Fig. 58). Beginning at the apex of the protrusion, the mucous membrane is seared with the actual cautery to within 1 or 2 inches of the anal



FIG. 58.—Linear cauterization of the mucous membrane of the rectum.

orifice. A rather deep line of cauterization is carried out on the posterior wall, lighter ones on either side, and a rather superficial burn on the anterior wall of the rectum. Too deep cauterization of the anterior wall is unsafe because of

the proximity of the peritoneal cavity.<sup>1</sup> The prolapse is now reduced within the rectum.

It is a well-known fact that a ligature or clamp and cautery operation for hemorrhoids, in which a large number are removed and the adjacent mucous membrane too freely excised, is liable to be followed by contraction of the anal canal unless dilatation is followed up in the after-treatment. Recognizing this principle, and the fact that the anal aperture in these cases of procidentia is sometimes enormous, I have aimed to cause a distinct narrowing of the anal canal above the internal sphincter by removing most of the mucous membrane of the anal canal by the ligature method or by excision and suture. The mucous membrane is seized with hemostats, and while elevated is dissected up for 1 inch or more. This should be done in sections, removing a quarter or more of the anal circumference at one time. As the assistant pulls down on the mucous membrane, a quarter section is ligated as high up as possible. In some instances it is advisable to use a double ligature to preclude the possibility of too much contraction at the site of the ligatures. The aim should be to leave an aperture into the rectum at this upper level that will scarcely admit the little finger. After the ligatures are all in place, three or four interrupted catgut sutures are placed around the anal canal where it has been denuded of mucous membrane. This will effect a further narrowing of the canal (Fig. 59).

<sup>1</sup> The twelfth case on which this operation was carried out in the essential details here described died on the tenth day of general peritonitis. An autopsy was secured and showed that there were two perforations of the upper rectum at the site of the anterior cauterization. This unfortunate result indicates very strongly that there is a good deal of danger in too free cauterization of the rectum. It is, therefore, much safer to limit the deep cauterization to the posterior wall of the rectum and if there is excessive redundancy of the mucous membrane three longitudinal strips can be denuded from the anterior and lateral walls and the mucous membrane united with catgut sutures,



"V"-shaped wedges of skin are now dissected off from the external sphincter at three or four points. This leaves a gaping wound about  $\frac{3}{4}$  inch in width. The wound is united as

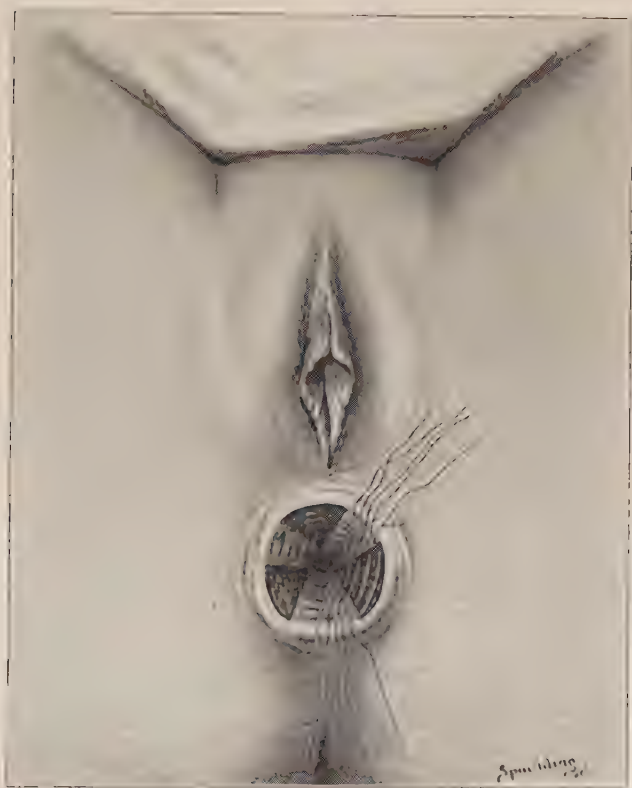


FIG. 59. Narrowing the anal canal. This part of the operation may be done as illustrated above or by either the clamp and cautery or ligature method.

follows: With a curved needle, using silkworm gut, a deep stay suture is placed about the middle of the wound, rather deeply through the external sphincter muscle and tied.

The suture of the skin is completed with plain catgut (Fig. 60).



FIG. 60.—Further narrowing of the anal orifice by excising three elliptical folds of the skin. *a*, Outline of folds of skin; *b*, skin removed; *c*, skin sutures; *d*, stay suture through external sphincter muscle.

*After-Treatment.*—The most important feature of the after-treatment is to confine the patient strictly to bed for three weeks at least. The bowels should not be moved until the fifth or sixth day, when a laxative should be adminis-

tered late at night and an oil and saline enema in the morning. Defecation should take place on a bed-pan and the patient cautioned against undue straining. The anal region should be cleansed three or four times a day, as there is usually considerable secretion following this operation. The silk-worm gut sutures are removed on the sixth or seventh day. For two or three months following the operation the patient should take a laxative as needed, rather than strain unnecessarily when at the toilet.

**Obliteration of the Cul-de-sac of Douglas.**—Many surgeons have adopted an operation which consists in obliterating the cul-de-sac of Douglas. Moschcowitz describes the operation as follows:

“Median abdominal incision, extending from the symphysis pubis to the umbilicus. After opening the abdomen, the patient is placed in an extreme Trendelenburg position. Everyone with any experience knows the depth of the cul-de-sac of Douglas in a normal case, but he will be intensely surprised at its depth in cases of prolapse of the rectum; in fact, it extends several inches beyond the anus, as one can readily convince himself. The rectum is now pulled up and held taut. The subsequent steps vary according to the sex of the patient; I shall describe an operation in the female sex.

“Pagenstecher or silk sutures are passed circularly around the cul-de-sac of Douglas and tied. The lowermost suture is placed about 1 inch above the inferior extremity of the cul-de-sac; similar sutures, 6 to 8 in number, are passed at intervals, and persisted in as long as the peritoneum comes together until practically the entire pouch of Douglas is obliterated.

“It is advisable, and I always try to include in my suture the pelvic fascia, particularly that part which covers the

levator ani; how often I really succeed in doing this I am not in a position to state.

"Theoretically it would be better to split the peritoneum in the depth of the cul-de-sac, and to suture the fascia first. I have attempted to do so in one case, but found the procedure so difficult that I abandoned it.

"When the sutures reach the region of the supravaginal portion of the cervix and body of the uterus, the sutures are anchored to these structures.

"When approaching the rectum, the sutures coming from the sides of the pelvis, catch the serosa covering it, in firm and close stitches. This is done, in order to prevent the possible formation of a hernia; in addition, these lateral sutures also materially aid in fixing the rectum to the sacrum and coccyx.

"There are two structures which should be avoided, namely, the ureters and internal iliac vessels. The former can be marked by introducing ureteral catheters; the pulsation of the latter serves as a guide; neither of these structures have thus far caused me any embarrassment.

"In older women the uterus is stitched to the anterior wall.

"No fixation of the intestine, viz, sigmoid flexure, is undertaken, as it is superfluous.

"Suture of the abdominal wall in layers as usual is required.

"The after-treatment is simple. I neither constipate nor move the bowels of the patients. The bowels will generally move of their own accord in less than a week. I have found that most of the patients require catheterization. In other particulars the after-treatment is that of any laparotomy."

Moschcowitz considers his operation ideal, provided he can get the cases early, before the protrusion has become too extensive.

Jones feels that this operation which sutures nothing but

peritoneum will probably not be permanent. Therefore, to prevent recurrence, he goes a step farther than Moschcowitz and attaches the rectum "to the pelvic peritoneum on either side, as high as the promontory, by silk sutures, in the hope of getting support from many attachments to the peritoneum." Jones also is of the opinion that in many of these cases of extensive prolapse an operation on the lower rectum, in addition, is advisable. He recommends removal of the mucous membrane with the cautery, and in some instances a posterior rectopexy. He states that "while the giving away of the posterior attachment is not the cause of prolapse, the posterior attachments are loosened and pulled down late in the course of the prolapse. Fixation, therefore, of this portion of the rectum must be of some value in holding up the organ." Jones, as well as Moschcowitz, calls attention to the fact that in closing the posterior cul-de-sac there is some danger of injury to the ureters and great vessels, though they have never as yet encountered this complication.

**Sigmoidopexy.—Rectopexy.**—The various "-pexies" were much in vogue a few years ago, but as none of them ever appealed to me I am unable to speak of their value from personal experience. Anatomically, the principles upon which they are based are ill-founded, and the fact that there is very little mention made of them in the literature of late would indicate that they have not stood the test of time.

A sigmoidopexy exercises very little tension on the lower rectum and therefore is not practicable. A rectopexy aims to secure firmly the posterior wall of the rectum, but in no way supports the anterior and lateral walls, which in most cases are as much, if not more, involved in the prolapse.

**Excision.**—There is excellent authority for the operation of amputation of the rectum, but in my opinion it should be reserved for conditions which cannot be relieved in any other

manner. There are occasionally very extensive prolapses in which this procedure must be seriously considered. Miles recommends excision "where the apex of the procidentia corresponds to the recto-sigmoidal juncture." In other words, in a case of this kind the external wall of the prolapse would include the whole of the rectum, while the inner wall of the same prolapse would represent the invaginated sigmoid. Such cases, however, are rare and anything less than complete excision would not be apt to effect a permanent cure. While the operation of excision in prolapse of the rectum, for some reason or other, has a very low mortality in comparison to that which accompanies excision for cancer of the rectum, I feel very strongly that it should never be employed in the ordinary run of cases, as the operation is more or less mutilating to the lower musculature of the rectum: the levator ani must be divided; the internal sphincter is sacrificed, though the external may be saved, and it is impossible to attach them to the amputated gut in such a manner that they will ever function normally again.

One very unfortunate case that came under my observation two or three years ago was very largely attributable to an excision when some other method would have been preferable. The patient made a good recovery from the operation, but a very tight stricture near the anus ensued. Dilatation proving unsuccessful, a colostomy had to be performed to cure the stricture. When the stricture had been cured and the colostomy closed, a prolapse of even greater extent followed within two or three months. The next attempt to relieve the prolapse was an abdominal operation with closure of the recto-vesicle fold. Within a few months the prolapse recurred, and when I first saw the patient there was a protrusion of about 3 inches, with absolutely no fecal control. The prolapsed gut was out at all times except when



the patient was lying on his back, and he was absolutely incapacitated. After two or three plastic operations under local anesthesia, I succeeded in so improving his condition that he was able to resume his occupation as a tailor. At defecation there still remained a protrusion of 1 inch or more, but it was spontaneously reduced and did not recur when he was walking about. He had absolute incontinence, however, and naturally was much inconvenienced on that score.

## CHAPTER XI.

### PRURITUS ANI.

THE entire category of rectal affections contain none more annoying to the patient or more stubborn to treatment by the proctologist than pruritus ani. Because it is so common and because it seems such a simple thing, to those who suffer from it there appears no reason why it cannot be readily cured. That its treatment is so baffling is due to its varied and sometimes obscure etiology.

**Etiology.**—The causes to which pruritus has been attributed are innumerable, some writers claiming that it is a disease of itself, others that it is merely a manifestation of an underlying condition. Murray asserts that it is a primary infection caused by the streptococcus fecalis; others that the pruritus is present first and the infection induced by scratching. Certain articles of diet seem to be responsible in some cases, or it is aggravated by too free eating and drinking or smoking. Sedentary habits of life apparently provoke it. In certain people, the skin, because of its delicate nature, has a natural predisposition to becoming irritated, which is followed by itching. Many constitutional diseases, such as diabetes, rheumatism, gout, tuberculosis, and syphilis are claimed by some to be etiological factors of much importance.

Indeed so much has been written that the whole subject has become very complicated. In order to simplify it, I think we may divide cases of pruritus ani into two classes. In those coming in the first group there will be found a

coexistent rectal disease which keeps the perianal skin moist with discharges, the skin becomes soggy and soft and pruritus results; in the second class may be put those cases for which no other cause can be found and which unquestionably are due to infection by the streptococcus fecalis or some of the other common intestinal flora.

In a few cases there will be found a coexistent constitutional condition by which the pruritus seems aggravated, such as an intestinal toxemia due to indiscretions of diet, genito-urinary, gynecological, or other affection, but in the great majority of these cases careful examination will reveal a concomitant rectal lesion, which will permit their being classified with the first group. It has been my experience that whenever any distinct rectal pathology can be discovered its cure will almost invariably result in great improvement, if not in entire cure, of the pruritus and many times will have a salutary effect on the general condition.

**Symptoms and Diagnosis.**—The itching may be confined to a small area or spread over the entire perianal region and may be continuous or intermittent. Usually it is most annoying at night. When it has been of long-standing, the patient will invariably have reached such a state of desperation that he will submit to almost any amount of pain if it promises hope of relief.

Inspection will show the skin to be either dried, reddened, wrinkled, and in old cases much thickened at the anal orifice; or else, in other instances, blanched, moist, and often macerated. As a rule, there will be numerous excoriations from scratching, for the perianal skin is of very delicate texture and easily abraded. Often rubbing the parts through the clothing is sufficient to cause abrasions and a reinfection of the tissues. That such reinfection does take place is proved by the fact that if the patient can exert sufficient

strength of will to refrain from scratching and allow the parts to heal, a great step will have been accomplished in the treatment.

**Treatment.**—Though the theories of its etiology are many they are far exceeded in number by the therapeutic remedies advocated. Every proctologist, every general practitioner, every druggist has some salve, ointment, or injection that he advises.

Being dependent on the etiology, the treatment of these cases falls into two distinct groups; that to be employed in those cases in which rectal disease is present, and the type of treatment to be used where the *Streptococcus fecalis* or other infecting organism is the primary cause. The treatment of the first class will, of course, be contingent upon the nature of the rectal disease present.

External hemorrhoids are more frequently the cause of pruritus than internal ones. These ragged tags of redundant skin render it almost impossible for the patient to cleanse properly the anal region after defecation and this persistent fecal soiling sooner or later produces a dermatitis in persons predisposed to its occurrence. Somewhat less frequently internal hemorrhoids, even though small, prevent perfect anal closure and the result is leakage of the rectal secretions upon the perianal region. They are especially troublesome when associated with numerous skin "tabs" as just mentioned.

Mucous membrane prolapse, or prolapsing internal hemorrhoids are nearly always associated with a great deal of rectal mucus, which is very irritating to the tissues and in some cases causes pruritus. Their removal will almost certainly cure the itching eventually, although in some cases the patient must take unusual care of the anal toilet for some months after the operation before it all disappears.

In the same way, all obvious lesions of the rectum, such as

small polyps of the anal canal, anal fissures, fistulæ, rectal verruca, etc., do doubtless occasionally cause itching about the anus, but very seldom in the writer's experience are they the cause of an old chronic or inveterate pruritus ani. When encountered, however, associated with pruritus, they should be dealt with according to their special surgical indications.

On the other hand, there are certain less obvious lesions which require more skill for their detection. A very frequent one is the superficial ulcer or abrasion of the anal canal, first recognized by the late Mr. F. C. Wallis of London. He maintained that it was present in 90 per cent of all cases, and attributed the frequency of its occurrence to the method of fusion of the proctodeum with the blind end of the gut. According to Wallis: "The fusion takes place at a variable line between the sphincters. The lining membrane of the proctodeum is thin, and, unlike the mucous membrane, is scantily supplied with bloodvessels, and thus abrasions in this locality are easily brought about. But, because of the ever-altering condition of the sphincters, and because of the contents of the bowel, they rarely heal of their own accord." His method of treatment, briefly described, was as follows: The ulcer is anesthetized by the injection of a few drops of 2 per cent procaine solution immediately beneath it. This elevates the lesion so that it can the more readily be cauterized with the galvano-cautery knife. After this it is smeared with vaseline, and an opium suppository inserted in the rectum. In very bad cases, when there was considerable ulceration, Mr. Wallis was in the habit of using a general anesthetic in order that the sphincters might be stretched and the actual cautery used.

Several years ago I had the opportunity of seeing Mr. Wallis treat a large number of patients by this method, and was greatly surprised that the cure of such a small lesion

as was sometimes discovered would so quickly relieve the patient of the intense itching. Since then, in my own practice, I have often demonstrated the fact that the whole cause of the pruritus may be attributed to a very small ulcer or abrasion of the mucous membrane of the anal canal.

In catarrhal diseases the rectum is never entirely free from feces, a condition which is productive of chronic forms of proctitis, sigmoiditis, superficial ulcerations, etc. The passage of flatus allows a small quantity of mucus to escape, thus moistening and irritating the anal region. These patients are best treated by securing soft evacuations of the bowels at least once in every twenty-four hours by means of a suitable aperient taken at bed-time. After the bowels have been moved in the morning, the rectum should be washed out with  $\frac{1}{2}$  pint of a 2 per cent boric-acid solution. Furthermore, it will be found beneficial to make stimulating applications of silver nitrate or balsam of Peru to any abrasions or ulcerations which may remain, a procedure which is best effected with the proctoscope, with the patient in the knee-chest position.

Situated from 3 to 9 mm. above Hilton's white line are several small pockets, the function of which, so far as the writer is aware, has never been satisfactorily explained. It is asserted that they have something to do with either the secreting or the storing of rectal mucus, while, on the other hand, Stroud suggests "that they are simply the mechanical result of constricting the wide rectal tube to its small rectal orifice." The free borders or valves of these small pockets consist chiefly of nerve fibers, ganglion cells, and a very small amount of connective tissue elements. These little pockets will admit a probe which has been bent upon itself from  $\frac{1}{4}$  to  $\frac{1}{2}$  an inch, and with the windowed anoscope may be readily seen and explored.



Some authors make a good deal of these pockets and find them when infected the chief cause of pruritus. My own experience has been that only in the very exceptional case are they associated with pruritus ani, but they are of enough importance so that one should always keep them in mind. When discovered they should be laid open under local anesthesia and the wound allowed to granulate, in the same way as a fistula, and the incision should be carried outside the anus to secure free drainage.

Growing from the margins or surfaces of these valves one frequently finds little white projections or teats, which can be made out by the exploring finger. Stroud explains their presence here as "accessory sense organs of a higher degree of development than the major part of the pecten, and not pathological outgrowths." When hypertrophied or elongated they cause many distressing sensations about the anus. Among them may be mentioned uneasiness in the rectum, such as a "creeping, crawling" sensation, and a feeling of incomplete relief after defecation. Quite frequently pruritus is the most prominent symptom. The treatment of this condition by ablation is very satisfactory and consists in snipping the growths off with a pair of nasal scissors as they protrude through the window of the anoscope. It is best to apply a strong solution of cocaine before removing them.

The exciting cause of the pruritus having been discovered and eliminated, appropriate treatment should now be directed toward the amelioration of the skin condition. It seems probable that it is the product of a chronic inflammation of the skin, with more or less thickening and infiltration, which in some way throws out of gear the "simple nerve endings which exist so abundantly in the epidermis." It is this departure from the normal which produces the sensation of itching; therefore, it is our task to make such applica-

tions as will restore the skin to normal. The patient should be instructed to cleanse thoroughly the anal region at night and after defecation, preferably with absorbent cotton which has been wrung dry of some antiseptic solution such as 4 per cent boric acid or 2 per cent carbolic acid. When there is a good deal of moisture the parts should be protected from friction and the irritation of the discharge by wearing, day and night, an anal pad held in place by a T-bandage. The pad is best made with one layer of sterilized gauze wrapped about a pad of cotton. Too much gauze absorbs the greasy portion of the ointment when mineral ingredients are used, and shortly the skin of the anal region becomes dry and irritated.

Those cases in which the dermatitis is acute (*eczema ani*), accompanied by many excoriations from scratching and rubbing, require applications and ointments of a soothing nature, such as the following:

Phenol . . . . .	grs. xv
Zinci oxidi . . . . .	ʒj
Ung. aquæ rosæ . . . . .	ʒij

Whether we use ointments or resort to stronger applications will depend on the severity of the case. In a case of average severity these instructions in regard to the anal toilet may be all that is required.

On the other hand, there are more inveterate cases in which the skin is nearly always tough and leathery and covered with dead and sodden epithelium. The problem in these cases is to bring about a gradual destruction of this new-formed epidermis without too much inconvenience to the patient. For this purpose the method advocated by Adler is very useful.

Adler's method is as follows: At the first visit the perianal skin is painted with a saturated solution of nitrate of silver.

Provided any abrasions present are previously anesthetized with a 10 per cent solution of cocaine this should occasion no discomfort. The application of the silver should be repeated at intervals of four or five days until all the dead epithelium has been removed. After the silver has dried, the anal region is smeared with citrine ointment and the patient requested to report daily for the first two weeks and then every other day for a like period, after this, once or twice a week until the skin has regained its original color, suppleness, and elasticity. At these visits the exfoliating layers of skin epithelium, which come away after application of saturated solutions of silver, are gently removed with tissue forceps, the anal region cleaned with cotton swabs and any excoriated areas noted are painted with Tr. Benzoin Comp.

It is very important that these details be attended to otherwise the parts are sore and the itching may be intense as a result of the abrasions that follow such vigorous treatment.

It has been my experience that in those cases in which the skin was considerably thickened and tough, the saturated solution of silver is more satisfactory than weaker solutions. On the third day after its application, by placing hot fomentations over the anus for a few minutes, a layer of exfoliated epithelium may be removed almost *in toto*. In those cases, however, in which the skin is more delicate, the same purpose is served equally well with a weaker solution.

This brings us to the second group of cases, in which no rectal pathology is present. In the more recent cases, seen in their early stages, before any very definite changes have taken place in the epidermis, cure may often be effected by local applications wisely applied. Frequently all that is necessary is to caution the patient to observe greater cleanliness of the parts, using soap and water night and morning

and drying them with a soft towel. I very often advise the use of absorbent cotton which has been dipped in water and wrung dry, in place of toilet paper. This cleans the parts more effectually after defecation and does not cause pressure abrasions.

A very useful and simple ointment, especially useful when there is an eczematous condition of the anal skin, is the following:

Crude coal tar . . . . .	3ss
Zinci oxidi . . . . .	3i
Petrolati . . . . .	3i

When there are numerous fresh abrasions, the following solution may be used, applied on a small pledget of cotton twisted on a toothpick:

Tincturæ iodi . . . . .	3j
Spiritus etheris comp. . . . .	3j

This should be diluted one-half with water when first used as it sometimes causes considerable momentary smarting, which passes off immediately. Another application which is used in the same way is:

Argenti nitratis . . . . .	gr. xxx
Spiritus etheris nitrosi . . . . .	3ij

This latter prescription acts like a charm in the painful little cracks in the gluteal fold 2 or 3 inches posteriorly from the anal orifice with which some patients are occasionally affected, and is also useful in pruritus. For some of the milder cases a simple dusting powder, such as compound stearate of zinc with acetanilid seems to afford the greatest relief. The iodine and nitrate of silver solutions should be used daily until the itching has ceased unless their use

increases the irritation, in which case the solutions should be diluted with alcohol.

When no rectal lesion is present and the pruritus is of longer standing, some method must be adopted which will destroy the infective process going on in the perianal skin. To accomplish this result Murray uses autogenous vaccines. My experience with this method was a very limited one and I would not presume to speak with authority, but I have not found it satisfactory. It is too uncertain and the difficulties of procuring the particular vaccine are almost insurmountable. It is necessary first to get a pathologist who is willing to devote the time to the preparation of these vaccines and even then, according to Murray's own experience, so many errors creep in that the method has never met with general acceptance.

**Ionic Medication.**—The method of treating pruritus ani by ionic medication is based on the fact that the disease is caused by an infection of the perianal skin by one of the streptococcus group of organisms, the one most constantly present in the tissues being the *Streptococcus fecalis*.

Rolfe, of Boston,<sup>1</sup> has done much to bring this method of treating pruritus ani into use, and has based his studies on the established etiology of the disease. It is a form of electrical treatment, whereby the ions of certain metallic salts, notably those of zinc, iodine and mercury, each having marked antiseptic properties, are driven into the deeper layers of the skin by a direct current of electricity of low voltage.

Leduc<sup>2</sup> conclusively demonstrated by animal experimentation, that the ions of metallic salts can be introduced into the tissues to a depth of from 1 to 10 mm., which fact

<sup>1</sup> Boston Med. and Surg. Jour., August, 1919; Am. Jour. Surg., December, 1921.

<sup>2</sup> Electric Ions and Their Use in Medicine.

is important in the treatment of the disease under consideration in which the causative organisms are below the surface and out of reach of topical applications. Mummery<sup>1</sup> of London, found that 2 per cent of iodine in a 75 per cent solution of alcohol, introduced electrically was "more effectual (in the treatment of pruritus ani) than any other local method in use hitherto."

The treatment by ionic medication requires a special apparatus, and Rolfe has adapted the Ritter Dental Company ionization motor transformer and current regulator, by fitting the same with electrodes suitable for rectal work.

The motor transformer reduces the ordinary lighting current to the proper voltage, which should not exceed 50, and the current regulator permits the ampèrage to be adjusted from 0 to 10 milliampères.

The positive or negative pole of the instrument, depending on the polarity of the medicament used, is attached to a specially designed applicator fashioned to fit the contour of the anal region. This is covered with a thick layer of absorbent cotton wet with a water solution of the agent to be employed.

The other pole is attached to a metallic plate 6 x 8 inches covered with several layers of Canton flannel wet with salt solution, and with the patient lying on the table on the right or left side, is applied to the abdomen and held firmly in place by him.

Oxycyanide of mercury 0.25 to 0.5 per cent, Lugol's solution of iodine diluted five or six times, zinc chloride 0.5 per cent, and permanganate of zinc, 0.25 to 0.5 per cent strength are the medicaments which so far have been found best suited to pruritus cases. I have found permanganate of zinc most generally useful, though some cases seem to yield

<sup>1</sup> Diseases of the Rectum and Anus,



more readily to iodine, depending, to a large extent, on the delicacy and sensitiveness of the perianal skin. Where the perianal region is macerated and moist from discharges, the zinc chloride has a salutary effect in that it dries up the secretions. It is better to use weak, rather than strong solutions, varying the strength of the current according to the case being treated.

Each treatment should be at least fifteen minutes long and about 6 or 7 milliampères is the appropriate strength of current, though some patients will stand more, and to others where there is a good deal of excoriation, this amount will be intolerable because of the pain excited.

This method which I have been using for nearly six years, has proved remarkably successful in many old and hitherto intractable cases. While not applicable to those cases the etiology of which is dependent on some real coexistent rectal pathology, I have found it promising above all other methods of local treatment and curative to a very satisfying degree in a disease so obdurate as pruritus ani.

After some experience, all these cases fall into rather definite types that are more or less easily recognized, and it is only the exceptional case that cannot be greatly relieved, if not cured, by some one of the accepted methods of treatment. Nevertheless, recurrences are liable to take place and in that respect one should be guarded in his prognosis.

## CHAPTER XII.

### RECTAL INCONTINENCE.

Loss of control of the function of defecation is most unfortunate and distressing, and renders the patient unfit for the ordinary duties of business and social life. The term "fecal incontinence" is relative and may imply any degree from a slight soiling of the clothing during an attack of diarrhea in a person otherwise normal, to the passage of stools without any control or knowledge.

**Etiology.**—It is caused by an impairment of the function of the internal or external sphincters or both. While some surgeons believe that only the internal sphincter is concerned and that if this muscle is preserved intact, it does not so much matter about the external sphincter, this is only partially true, for the external sphincter is a voluntary muscle which can be contracted at will and if this voluntary action is interfered with, incontinence is apt to ensue.

Any one of several conditions may lead to prevention of complete control. There may be some local disease of the rectum, which disturbs the function of these muscles, such as a prolapsed hemorrhoid in the anal orifice, or a procidentia of the rectum which stretches the sphincter beyond its normal limits. Or, a stricture with ulceration and resultant fibrous tissue may impede normal contraction.

On the other hand, the cause of the incontinence may be referable to disease of the central nervous system, as in epilepsy; or tactile sensation in the sphincters may be entirely lost in paralysis. There may also be loss of function in the

complete prostration which occurs in severe constitutional diseases, such as typhoid, pneumonia, and tuberculosis.

Aside from trauma following certain improperly performed operations, which we will speak of in detail presently, there may be damage to the sphincters during child-birth, due to rupture of the perineum, or, occasionally, due to falling on some hard, pointed object, which may have been driven into the rectum.

**Operative Incontinence.**—When a patient is confronted with an operation for hemorrhoids or fistula, the fear of resulting incontinence seems to be the paramount obstacle. It seems to be a fixed idea with the laity, and not infrequently with the profession, that incontinence is a habitual outcome of these operations. The prevalence of this misinformation can, no doubt, be laid to some extent to the pernicious advertising of charlatans who, from time immemorial, have found it to their interest to foster their own trade by keeping this fear before the public.

As a matter of fact, complete incontinence is infrequent and partial loss of function following operations relatively so. After nearly all rectal operations there is more or less temporary incontinence for a week or ten days, but this should entirely disappear after the wounds have healed.

The principle cause of incontinence following an operation for hemorrhoids I believe to be the over-divulsion of the sphincters, and I have seen numerous patients in whom partial loss of control could be directly attributed to this. Many surgeons seem to think divulsion so important that in the thoroughness with which they perform this step the muscle fibers are lacerated and torn. It is also a common saying with some of the profession that paralysis of the sphincters prevents postoperative pain. While this may be so, the dilatation should never be carried to this extent; the

sphincters should be dilated only enough to secure access to the hemorrhoids for their proper removal.

The Whitehead operation, in which the entire pile-bearing area is removed and frequently all the sensory tactile nerves in this region are sacrificed, is often followed by a certain amount of loss of sensation whereby the sensitiveness to fecal material in the rectum is destroyed. Furthermore, after this operation, even though the sphincters may not have been damaged by over-stretching, a dense deposit of fibrous tissue is often formed around the anus when primary union has not been secured, which will seriously interfere with the normal action of the muscles at the anal orifice.

The dangers of incontinence after operations for fistulæ and the procedures required to circumvent this catastrophe have been considered on page 107. Though more excusable and less easily avoided than are such accidents following the removal of hemorrhoids, the results, so far as the patient is concerned, are equally deplorable. To cure some of these fistulæ with deep tortuous sinuses frequently requires great ingenuity on the part of the surgeon. As a rule it is unnecessary to do more than incise the external sphincter, and if this is divided at right angles rather than transversely, and the incision lightly packed, there is no danger of incontinence except in cases that have been long neglected and where there has been so much suppuration in the neighborhood of these muscles that they have been either destroyed or rendered fixed by deposits of cicatricial tissue.

Another sequel of operations for fistula which leads to incontinence is a mucous membrane prolapse following the division of the external sphincter. These protrusions of mucous membrane relax the anal outlet, greatly diminishing the power of control. In such cases, even though the sphinc-

ters may seem to have lost their contractile power, all that is necessary to cure this condition is to remove whatever redundant mucous membrane is present by area ligation. This procedure has relieved the incontinence in many of my patients and should be tried before attempting the usual plastic operations on the sphincters.

**Operative Treatment.**—The ideal plastic operation would be to reunite the severed ends with such a degree of accuracy that the muscle would closely approximate its normal condition. Frequently, however, these patients are not seen until so long after the damage has been done that there is a large amount of cicatricial tissue. The muscle ends are widely separated and imbedded in scar tissue and the muscle itself is so small and wasted that even if it were united, it would not function sufficiently to prevent incontinence.

As these cases are met with clinically, they differ a great deal, each one presenting a separate problem for solution. In no two is the operative procedure exactly alike. Nevertheless, they do fall into three or four general categories and a description of the operation indicated in each one of these would more or less cover the whole field and can be applied to all cases, with certain modifications which will occur to the surgeon.

Quite often a case is met with in which there is *very little scar tissue and the muscle ends can be plainly felt*. Except that the ends are bound down in a dimple of scar tissue, the muscle is in a fair state of preservation and contraction on the examining finger takes place. In other words, the anal orifice is patulous, and sufficient contraction may not take place to maintain fecal control. This particular type is due to the incision of the sphincter in small anterior fixtulae, more especially in women. The operation generally advo-

cated and nearly always successful, provided primary union is secured, is carried out as follows (Fig. 61):

The patient is prepared by purgatives on three or four successive days and a cleansing enema three or four hours before the time of the operation. A horse-shoe or semilunar

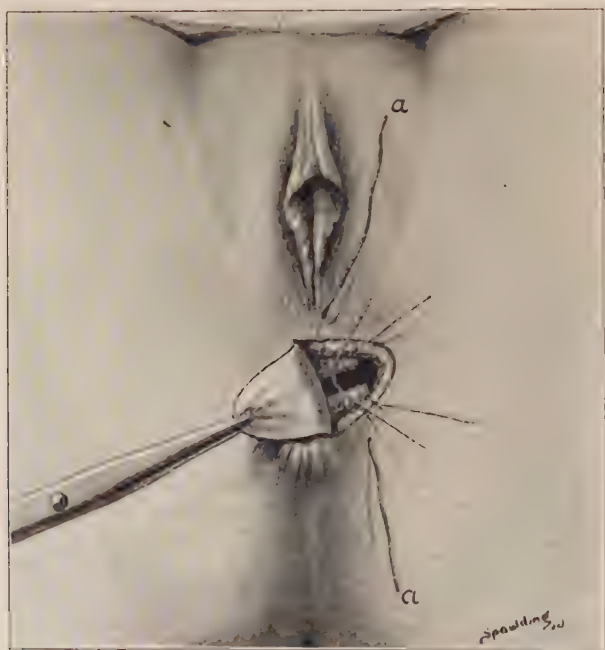


FIG. 61.—Ends of the external sphincter muscle united with chromicized catgut. *a*, silkworm-gut stay suture.

incision is made through the skin and sufficiently large to include the retracted ends of the muscle. The skin is then seized with a pair of tissue forceps and dessection is carried well into the anal canal, care being exercised not to button-hole this flap. The field of operation being exposed, the scar tissue separating the severed ends of the muscle is



dissected out and the muscle ends trimmed off so that they may be accurately coapted and united with interrupted chromicized catgut sutures. Perfect hemostasis is essential and all small cavities should be obliterated. Next, the skin flap should be sutured in place with silk, after which a silk-worm gut suture threaded on a large curved needle is passed through the muscle of one side, outside the dissected flap, and brought up through the muscle of the opposite side and tied over a small gauze pad. This is a stay suture used to relieve the tension on the sutured ends and should be placed deep into the operative field. The buttocks are now strapped together with a wide strip of adhesive plaster.

The after-treatment consists in maintaining absolute cleanliness of the wound, which should be dressed daily. The bowels should not be moved for seven or eight days, during which time the patient is kept on liquid diet and doses of deodorized tincture of opium,  $\mathfrak{M}$ v-x being given by mouth if necessary to quiet a desire to defecate. At the end of this period cotton-seed oil is injected daily until the bowels move. The patient should be kept in bed for at least two weeks. Usually, if strict asepsis has been practised, these wounds heal by primary union, and even though some infection may have taken place, it is usually superficial and, if recognized early and the wound opened and drained, no ill effects will follow.

*Where the Muscle Ends are Separated by a Wide Sulcus and Scar Tissue.*—This sometimes happens after an extensive fistula operation when there has been considerable sloughing of the muscular tissue and in the healing process the muscle ends have retracted and are bound down in dense fibrous tissue so that they cannot be dissected out. Not infrequently it is impossible to locate the muscle; in fact, there is very little muscle left. Under these circumstances about all one

can attempt to accomplish is the obliteration of the gap or sulcus, which is the greatest source of the incontinence, by dissecting out the scar tissue in such a manner that the side affected may be brought together by sutures and the gap which existed previous to operation closed. It is generally necessary to dissect out the scar tissue rather deeply, and in closing the wound two or three buried sutures are employed, after which three or four silkworm gut sutures are inserted completely around the whole incision taking care not to penetrate the field of operation at any point.

Mummery advises making "an incision parallel with the sides of the gap and about the same length, and to deepen this until its upper extremity is above the uppermost limits of the anal deficiency. The wound so made should then be sewn up with fish-gut sutures in the opposite direction."

A very rare condition associated with mild incontinence may be caused by a *patulous anus*. In these cases the external sphincter muscle is lax and of greater dimensions than normal. There is never much real incontinence but an almost constant escape of a little liquid feces which stains the clothing, and this causes some patients so much annoyance that they apply for operative treatment. This condition may be a manifestation of general muscular weakness, such as follows protracted ill-health, or, on the other hand, it may be due to the prolonged use of large rectal dilators. It is also caused by over-divulsion of the sphincters and the practice of over-long retention of a rectal plug, employed by many operators after hemorrhoid operations. At the same time, one should remember that a patulous anus is often associated with certain forms of nerve and spinal cord disease, notably locomotor ataxia, and this should be taken into consideration before undertaking any operative treatment.

The best operation is to make a posterior horse-shoe skin-incision and dissect up the flap in the same manner as previously described, exposing the fibers of the muscle. The anal circumference may then be considerably reduced by lateral sutures closing the angle which the external sphincter



FIG. 62.—Reducing the size of the anal circumference for patulous anus.

forms at its attachment with the ano-coccygeal ligament (Fig. 62).

**Incontinence Following the Whitehead Operation.** The patients who have come to me with incontinence following this operation have suffered from loss of sensation in the parts, a condition which could not possibly be improved by

operation. Mummery, however, states that loss of control in these cases is usually due to the fact that the sphincter muscle has become imbedded in scar tissue and recommends freeing the muscle. An operation which he has employed with much success has been carefully to expose the external sphincter, dissecting it loose from the surrounding fibrous tissue, care being taken to arrange the incision so that the resulting scar in the skin does not come in contact with the muscle. He states that everything depends upon securing rapid healing of the wound and for this reason insists upon careful asepsis.

In fact the most stringent asepsis is essential for good results in any of these operations for fecal incontinence and careful precautions should be taken both at operation and during the after-treatment.

## CHAPTER XIII.

### BENIGN TUMORS.

OUT of 3000 cases of rectal disease which had come under my observations up to 1913 there were but 49 cases of benign growths and to classify some of these as tumors required almost stretching a point, so small were they in size. In fact, in this series the innocent tumors were quite overshadowed by the cancer cases, of which there were 76. Hence, it will be seen that the subject of benign tumors cannot be considered a common one, and these benign growths would indeed be of little interest were it not for the danger of their undergoing carcinomatous degeneration.

**Classification.**—The two most common varieties of benign tumors are the *adenoid* and *fibroid polyps*. They may arise from any part of the rectum but are generally found in the lower 2 inches. In their simplest form these polyps are attached to the bowel wall by a narrow pedicle. They occur most frequently in children and give rise to repeated rectal hemorrhages. In most instances, owing to the constant downward force exerted by the feces and peristalsis, the pedicle is torn away eventually and the growth passed spontaneously. It is best, however, to remove them as soon as they are discovered, for they tend, especially in adult life, to undergo carcinomatous degeneration. For this reason a careful microscopic examination should be made of them at the time of removal, and should there be any uncertainty in the pathological findings, the patient should be examined

at regular intervals for signs of induration. Occasionally, some of these cases, either from mechanical irritation, infective processes, or ulceration in the immediate neighborhood, closely resemble and may be mistaken for cancer. They may be single or multiple. When multiple they are usually found throughout the large intestine and even occasionally in the small, such general involvement being termed papillary colitis or intestinal polyposis.

Small *fibrous tumors* located in the hemorrhoidal zone are fairly frequent and are often associated with hemorrhoids; in fact, so frequently are the two coexistent that it is probable they are due to an inflammatory condition of the loose fibrous tissue of this region.

*Papillomas*, or warty outgrowths of the perianal skin are of comparatively frequent occurrence and sometimes attain great size. They are usually encountered in patients who do not observe strict cleanliness, though frequently they are seen in those of cleanly habits. Like warts on the hands, or elsewhere, some people seem to have a predisposition to these growths.

*Hypertrophied anal papillæ* are small, teat-like, elongated projections of the valves of Morgagni. They occur at the junction of the skin and mucous membrane just within the anus. Usually there are two or three which require removal. The hypertrophy which takes place varies from a slight enlargement of the normal papillæ to little fibrous, pedunculated tumors the size of the end of a pencil.

*Villous tumors* of the rectum are very uncommon and but few cases have been recorded in medical literature. The chief point of interest about them is that they show a marked tendency to undergo malignant degeneration. I reported, the following case of this kind before the American Proctological Society in 1910.



CASE REPORT.—This patient was a woman, aged forty years; referred by Dr. J. H. Vaughn, of Everett, Mass., in

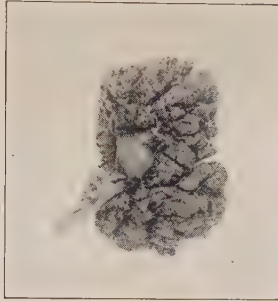


FIG. 63.—One-half of the tumor. Actual size after being kept in formaldehyde for three years.

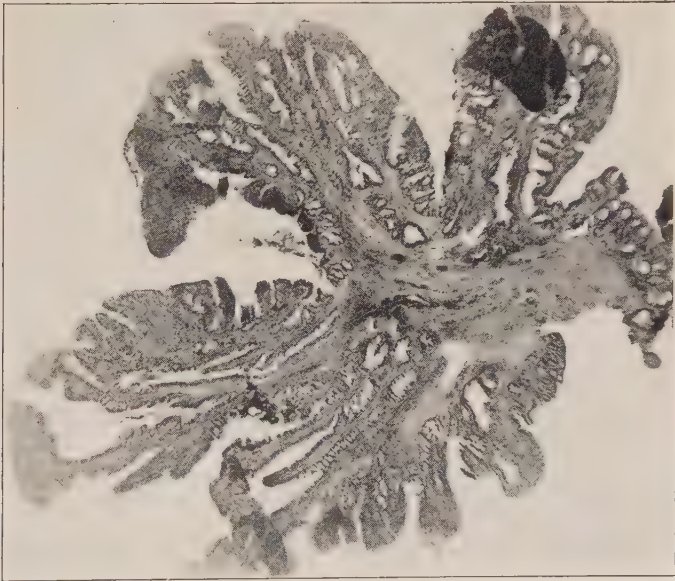


FIG. 64.—Specimen shows fibrous stalks from which the glandular portion of the tumor branches in the form of villi. ( $\times 13$ .)

1907. She was well nourished, weight about normal, anemic with sallow complexion, but otherwise in good health. She had been subject to rectal hemorrhages for six years. During the year previous to my seeing her, the hemorrhages had become more profuse, and a mass always protruded from the anus during defecation and even after slight exertion,

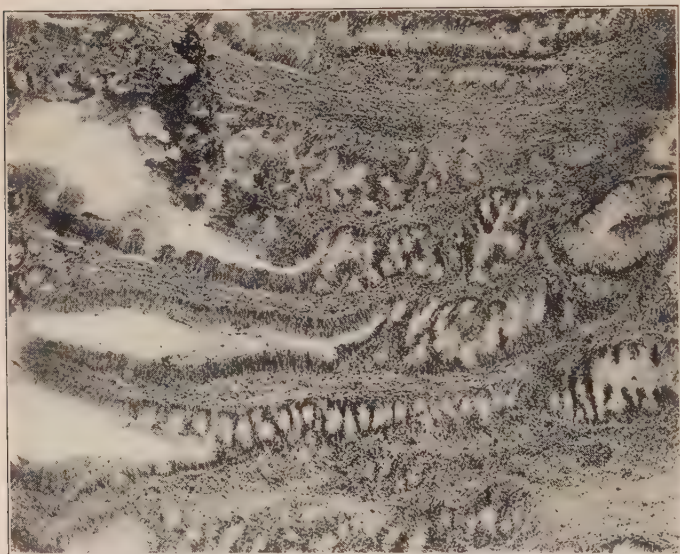


FIG. 65.—Showing villus under higher power, the connective-tissue stalk in the center of the villus. ( $\times 75$ .)

as when walking. It was necessary for her to resort to the toilet several times during the day, and to get up two or three times at night, when she would pass half a cupful of blood-stained mucus; also she was annoyed by the escape of mucus with flatus. For two months tenesmus had been present nearly all the time.

Digital examination of the rectum revealed a slippery

growth with a band-like pedicle, 1 inch wide, attached obliquely 2 inches above the anus. By careful manipulation I was able to bring outside the anal orifice a lobulated cauliflower-like growth the size and shape of a large English walnut, from which there was a gentle oozing of blood while it was held outside the sphincters.

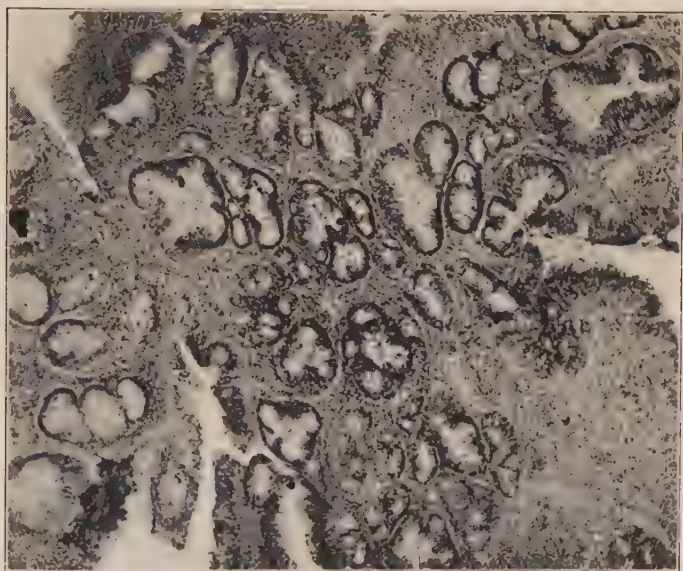


FIG. 66.—Glandular portion of the villus in cross-section. The membrane propria unruptured and the center of the acini containing proliferating endothelial cells.

A few days later I removed this tumor under local anesthesia, at the home of the patient. The sphincters first were infiltrated with a 0.25 cc. of 1 per cent cocaine solution, and fairly well dilated. The pedicle was next infiltrated and clamped about  $\frac{1}{2}$  inch from the margin of the tumor. It was then ligated in three sections, and the tumor removed.

As late as seven years after the operation there had been no sign of recurrence.

One of the most unusual growths ever encountered in the rectum is the *myoma*. It has been termed by Miles of London, a "pathological curiosity." It arises from the muscular coat and assumes a nodular form, supplied with a pedicle, as a rule, but sometimes exists as a broad tumor in the muscular wall of the gut without a pedicle. Tuttle cites only 5 cases in medical literature, and goes on to state that "these tumors are quite rare, and it is impossible to determine their nature without a thorough microscopic examination. If they are small and confined to the rectal wall the hard, nodular surface may frequently lead one to the diagnosis of scirrhus cancer." The following case is the only one I have ever seen and it was distinctly benign.

CASE REPORT.—Male, aged thirty-six years. Rectal symptoms had existed for four years, the most important of which was a gradually increasing, obstinate constipation. He had at last arrived at such a state that he was unable to have any dejections in a normal manner, but relied mainly on frequent enemata in conjunction with the daily use of strong cathartics. There was an uncomfortable sensation in the rectum much of the time. He was in the habit of going to the toilet five or six times daily, but was able to pass only small particles of feces. When in a recumbent posture he was comparatively comfortable, and at night he was free from the teasing tenesmus. At irregular intervals he was subject to small hemorrhages. One of the remarkable features about this case was the loss of weight, stated by the patient to be fully 30 pounds. This, without much doubt, was due entirely to the large quantities of pills and Epsom salts he was continually taking.

A digital examination of this man was a very interesting procedure. On the occasions when he had secured the best results from the laxatives and enemata the rectum felt perfectly normal as high as one could reach, but when the gut above was more or less filled with fecal matter, a large smooth tumor, which felt much like uterine tissue, could be easily located just above the sphincters. With the finger hooked about the growth, and the patient exerting some effort at expulsion, a portion of it could be seen at the anal orifice.

At operation the sphincters were thoroughly divulsed, and a large, smooth, irregular-shaped mass was delivered outside the anus with some difficulty. The pedicle was rather fan-shaped, and wiry and muscular tissue could be plainly felt in it. The attachment was nearly 4 inches above the anus, on the anterior wall of the rectum. After transfixion and ligation of the pedicle, I removed the tumor with scissors.

The growth was shaped like a mushroom. Its dimensions, as measured soon after removal, were  $3\frac{1}{2} \times 2\frac{1}{2}$  inches. It was found to consist essentially of spindle-shaped cells, arranged in bundles, with their long axis parallel to one another. These cells were regarded as more or less well-formed unstriated muscle fiber, and the tumor was identified as a pure myoma by Dr. J. H. Wright, pathologist to the Massachusetts General Hospital (Figs. 67, 68 and 69).

Among other benign tumors may be mentioned *angioma*, *chondroma*, *lipoma*, *cystoma*, and *dermoid cyst*. It is unnecessary, however, to speak of them separately as they have no special characteristics when found in the region of the rectum and differ in no respect from these growths as they are found elsewhere.

**Symptoms.**—Very small tumors, as a rule, occasion no symptoms whatever. It is only when they have attained



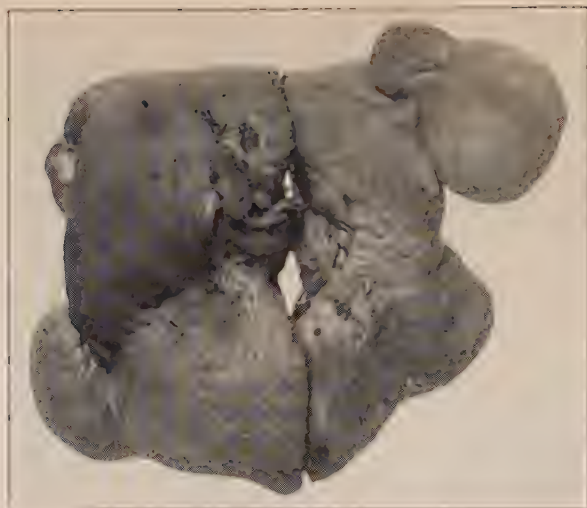


FIG. 67.—Myoma of the rectum, actual size.



FIG. 68.—Rod-shaped palisade arrangement of nuclei. ( $\times 50$ .)



considerable size that they cause diarrhea and more or less tenesmus associated with mucus and blood in the stools. The larger tumors act like a foreign body in the rectum, producing constant straining efforts to evacuate them. When they are protruded through the anus they exert a great deal of traction on the walls of the rectum, which sometimes is followed by prolapse.

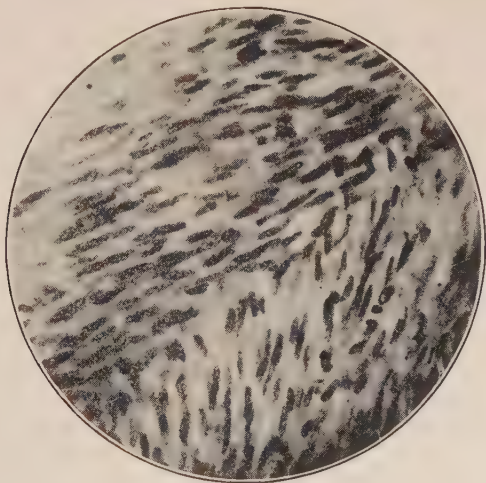


FIG. 69.—Rod-shaped palisade arrangement of nuclei. ( $\times 375$ .)

**Diagnosis.**—As ordinarily seen, the great majority of malignant as well as benign rectal tumors are characteristic and their correct diagnosis is easily made. Yet in recent years the general practitioner has begun to recognize the earlier symptoms of new growths and insists on a more thorough local examination in such accessible cavities as the rectum, with the result that more patients are now seen in an early stage, when the exact nature of the lesion is not by any means so apparent. Moreover, the practice of

removing a specimen for microscopic investigation and later performing a radical operation in case the growth is found to be malignant, is not permissible except in the most doubtful cases. Although, as a rule, it is easy to differentiate the benign from the malignant, still, the number of non-malignant lesions which come under our observation with all the clinical appearances of malignancy, and *vice versa*, are frequent enough to make it worth while to study them most carefully. And when we take into account the formidable, mutilating operation to be undertaken in the one instance and the simple procedure necessary for relief in the other, the problem of diagnosis becomes a very important one.

When more than one or two polypoid or semi-sessile growths present to the examining finger in the rectum, and particularly if they are rather higher than the zone of ordinary occurrence of single growths, and there is an associated history of diarrheal and mucoid discharges, one must at once consider the possibility of multiple adenomata, a most serious condition. When the growths are numerous and close together the feeling is distinctly like malignancy, and only by means of the proctoscope or sigmoidoscope can a certain diagnosis be made. These growths may, and usually do, occupy the major portion of the large bowel, bleed easily and may be soft or dense according to the amount of contained glandular or fibrous structure. They are very prone to malignant degeneration, and because one tumor is removed and found not to have been so transformed, one has no right to infer that it has not occurred in others.

When there is a large element of doubt in the diagnosis, it may be necessary to anesthetize the patient. While the proctoscope is perfectly satisfactory in diagnosing the more typical growths above the reach of the finger, I have not

found it of much assistance in questionable cases. With complete relaxation under a general anesthetic, it is often possible to get well above the mass and thoroughly palpate it. Frequently, in this way what had appeared to be a hard, irregular growth will become almost soft and pulpy under manipulation, and its benign nature will be established.

**Treatment.**—Although some of these benign tumors of the rectum have very little tendency to undergo malignant degeneration others of them seem to have a strong inclination in this direction, therefore, as a prophylactic measure it is much safer to advise their removal whenever encountered. They all have a tendency to increase in size and sooner or later will produce symptoms which will necessitate their removal.

The common *adenoid* or *fibroid polyp* can be removed under local anesthesia, as a rule. The growth should be hooked down with the finger or seized with the tenaculum if more convenient, the pedicle infiltrated with novocaine solution and clamped with a suitable pair of forceps as closely as may be to its attachment to the rectal wall. A strong linen ligature is next applied on the proximal side of the clamp, or, if broad, the pedicle is transfixed with it, and is tied in sections. The growth is then cut away on the distal side of the clamp, which is then removed, and in due time the ligature sloughs away.

Many of the smaller ones, especially those with a slender pedicle, can be easily removed through a speculum or by dragging them outside the anal orifice. The pedicle is infiltrated, ligated and excised. Frequently it is possible to remove the smaller polypi located high up in the rectum through a proctoscope, either by a snare or by electric cautery. This should be done thoroughly and the base cauterized to insure complete removal.

The treatment of *multiple adenoma* is largely palliative. A few cures have been reported from the employment of lavage of the large intestine, but such instances must be regarded as symptomatic rather than actual cures, for it is hard to understand how the tumors can be made entirely to disappear in this way. It may be that the origin of the trouble is some infective process little understood, which is relieved by keeping the parts clean. Sometimes a resection can be made of the affected portion with an end-to-end anastomosis. More often, however, there is such general involvement of the colon that a temporary or permanent cecostomy or ileostomy is advisable.

Although small *papillomata* of the perianal region can sometimes be made to disappear by making applications of glacial acetic acid, observing strict cleanliness, and frequent dusting with calomel, I have usually found this a tedious process and one which is not always successful. My practice has been to infiltrate the skin of the perianal region affected and excise them. This should always be done if they have attained any great size. Even after removal the patient should be seen at intervals of ten days for at least two months as they have quite a tendency to recur and if not kept under observation the whole crop may return, as I have witnessed after their removal by other surgeons. At these visits slight recurrences can be touched with glacial acetic acid.

*Hypertrophied anal papillæ* quite frequently give rise to peculiar creeping sensations in the rectum and are often found in neurotic subjects. Their removal is an office procedure. With a suitable speculum the papilla is exposed, its base infiltrated, its apex seized with a pair of forceps, and while stretched out, snipped off with a pair of nasal scissors.

If there is more bleeding than ordinarily, it can be controlled by a gauze pack allowed to remain for eight or ten minutes.

All the involved portion of a *villous tumor* should be excised, as these growths show a great tendency to malignant degenerative changes. If there are any signs of malignancy, such as indurated, nodular areas, complete excision of the rectum is indicated.

## CHAPTER XIV.

### CANCER OF THE RECTUM.

THE rectum and sigmoid are particularly liable to cancer, approximately 10 per cent of all malignant neoplasms having their origin in these organs. Its frequency is about on a par with cancer of the uterus and, next to the stomach, it is the most common location of all intestinal growths. The fact that a majority are within reach of the finger and those of the upper rectum and lower sigmoid are so easily diagnosed with the proctoscope make it rather inexcusable to have them overlooked so often. It is a common complaint among surgeons that many patients are inoperable when first seen, even though they had sought medical advice early. It is further unfortunate as, in intestinal carcinoma, metastasis takes place late, and if the case be seen early the probability of cure by radical operation is fairly good.

**Symptoms.**—While cancer of the rectum is more frequent after middle life, it may occur in the very young. It is not so uncommon to meet with them between twenty and thirty years of age.

The symptoms in the beginning are very slight, depending in some measure upon the location of the growth, which will be spoken of in more detail later. The sudden onset of constipation in a patient whose bowel movements have heretofore been normal is one of the very early symptoms, and is especially suggestive when associated with an uncomfortable sensation in the rectum. Later on the constipation alter-



nates with diarrhea. The earliest symptoms are some slight deviation from the regular action of the bowel associated with tenesmus and uncomfortable sensations. These symptoms gradually increase in severity, and when they are more pronounced, the movements are spoken of as unsatisfactory and there is more or less constant desire to have a movement, even when the growth is a very small one. There is a certain amount of uncomfortable, teasing tenesmus present which is very pronounced when the growth is located near the anal orifice. The passing of blood and mucus may occur early, but, as a rule, these are late symptoms, as are also marked loss of weight and cachexia. Patients with cancer of the rectum will often appear strong and robust until the disease is well advanced. The growth, located as it is in the terminal portion of the digestive tract, does not interfere with the process of assimilation of nourishment from the food as it does in the upper portions of the alimentary canal.

From what has been said, it will be seen that no definite statement can be given regarding the very first symptoms of cancer of the rectum. One can insist, however, that all abnormalities such as irregular action of the bowels, whether constipation, diarrhea or passing blood and mucus, be investigated. The number of cases which are hopeless, as regards operative cure, will be materially lessened if this is done.

**Diagnosis.**—A cancerous tumor of the rectum is very characteristic and anyone of experience will have little difficulty in determining the nature of the growth. The cancers commonly overlooked are the very small ones in which only a small nodule is present. Ordinarily one can palpate as high as the brim of the pelvis, and if a systematic procedure is followed out in making the digital examination, very few of these smaller growths will escape detection. The finger should be inserted to its full extent and the whole wall of the

gut carefully palpated with an encircling movement as the finger is withdrawn. If the whole surface of the rectum is palpated in this manner, even the smallest growth will not be missed. The tumor may completely encircle the gut, or be confined to a small portion of it, the area involved perhaps being only the size of a marble. It has a nodular, fosselated surface with marked thickening of the rectal wall. The "feel" of cancer, indurated and nodular, is very characteristic, and as the majority of these growths are within reach of the finger, there is very little excuse for overlooking them. Even when the growth is above the reach of the finger and the diagnosis has been made by the use of the proctoscope, one will often be more sure of his diagnosis if it can be palpated. This often can be accomplished, even when the growth is located 7 or 8 inches up the bowel, by having the patient assume the squatting position and asking him to strain down.

Biopsy, to confirm the diagnosis, has been frequently employed. This method, however, should be held in reserve for the very doubtful cases since cancer cells spread so easily; in fact, a word of caution might well be added at this point regarding digital examination which, for the same reason, should be conducted with gentleness.

**Choice of Operation.**—From a physical examination alone, it is most difficult to decide whether a case should have a radical operation, because it is impossible to know before an exploratory laparotomy whether metastasis has already taken place. Frequently patients in very good condition, with only small growths of the rectum, are inoperable, except in a palliative way, because of liver, mesenteric or peritoneal involvement. For this reason, I have come to the conclusion that operations from below, such as the perineal and Kraske's operation, have no place in the surgery of cancer of the rectum—except in rare instances to relieve pain. It is

unjust to submit a patient to an operation of this kind without knowing in advance whether it will be of benefit, for certainly, if the growth has involved other organs, such operations are but palliative procedures. It is pretty generally the opinion among those operators who have had large experience with cancer of the rectum that perineal extirpation almost invariably is followed by a local recurrence. It is my opinion that, if any operation is to be undertaken, it should be a combined one. The abdominal approach admits of a wide dissection and thorough removal of the natural zones of spread of cancer cells. In other words, unless an operation offers a fair prospect of cure, it is a wiser plan to employ palliative methods, such as attention to the diet, laxatives to secure free movements, irrigation of the rectum to allay the infective ulcerations about these growths, curetting and the use of the actual cautery. These two latter methods are frequently useful when the growths are enlarged fungous affairs confined mostly to the posterior walls of the rectum, but it must be remembered that if the growths involve the anterior wall, these methods are distinctly dangerous, as they may be followed by peritonitis, due to heat radiation and possible perforation.

**Inoperable Cases.**—From the physical examination alone it is almost impossible clearly to determine the operable and inoperable cases. There are certain cases in which the growth is so advanced that neighboring structures, such as the prostate gland or vagina and uterus are already involved, and in these cases radical procedure is out of the question. Aside from these, there are patients whose condition, because of infirmities and advanced age, cardiac disease and general poor health, precludes a radical operation.

**Palliative Treatment.**—When colostomy is refused, as it frequently is, palliative treatment should be instituted. The

matter of diet in this connection is important. A liberal diet, with nourishing food, such as eggs, milk, meats and a certain amount of starches, is useful in maintaining the patient's strength. The foods to be avoided are rough vegetables which form a bulky residue, increasing the fecal accumulations. The aim should be to keep the patient well nourished, concentrating the diet as much as possible. Laxatives, such as cascara sagrada, small doses of compound licorice powder assisted by paraffin oil in as large quantities as the patient will tolerate, are very necessary, since they relieve irritation.

Rectal irrigations afford great relief to many patients, for they keep the ulcerated and infected parts clean. I believe it is not generally appreciated how much relief is afforded thereby. This may be accomplished by a two-flow rectal irrigator, or, in case the growth has become strictured, it is often possible to pass a small Wales bougie through this area unless it be blocked above and below by the growth. For this purpose non-irritating saline or boric acid solution may be used. It is the ulceration and infection about the growth that cause the tenesmus and pain associated with these tumors, but if they are kept scrupulously clean, much relief is afforded.

**Colostomy.**—When to advise a colostomy is a mooted question. Patients, as a rule, regard this operation as a great calamity and wish to avoid it as long as possible, and many medical men hold the same opinion. Whether they are wise in taking this point of view of an operation which affords the greatest relief and allays much suffering in these deplorable conditions, is questionable. When an immediate colostomy will save so much suffering and put the patient in so much better physical condition, it seems to me to be most unwise to wait until obstruction, which is usually the end of

many of these cases, has already set in. The operation is almost without mortality, except when obstruction has become acute. The difficulty is that no one can tell when obstruction is going to take place, as it is impossible to keep a patient under daily observation. It may come suddenly without much warning, due to an intussusception or to a plugging of the strictured area with feces. Some patients are much more liable to acute obstruction than others because of the location of the growth. Those at the recto-sigmoidal juncture are peculiarly liable to become obstructed, because as in intestinal cancers, the growth tends early to encircle the gut. For these cases a colostomy should be advised at once.

When the neoplasm is located in the ampulla of the rectum where the circumference is greater, obstruction is much slower and there is less danger of its sudden onset. Seldom does the growth completely encircle the rectum so as to cause obstruction until the later stages of the disease. When the patient is kept under close observation, colostomy can safely be deferred (so far as obstruction is concerned), although here again much suffering would be avoided by an early operation. As the growth increases in size, ulceration and infection take place, resulting in perirectal abscesses and fistulæ of the pelvi-rectal spaces which are constantly reinfected from the feces, and are the source of much suffering. When the cancer is located in the anal canal or near the anal orifice, there is not so much danger of obstruction, still the colostomy cannot be postponed indefinitely because of the highly sensitive nature of this region. Notwithstanding the objection of both patient and, frequently, the attending physician, I firmly believe nearly every inoperable case of cancer of the colon or rectum would be better served by an early colostomy. Should obstruction never take place,



they would be saved most of the distressing complications which are invariably associated with these growths.

**Operation—Colostomy.**—There are several different methods of performing a colostomy, all aiming to secure the best possible functional control of the artificial anus. The simplest procedure to obtain this result is to make a very small

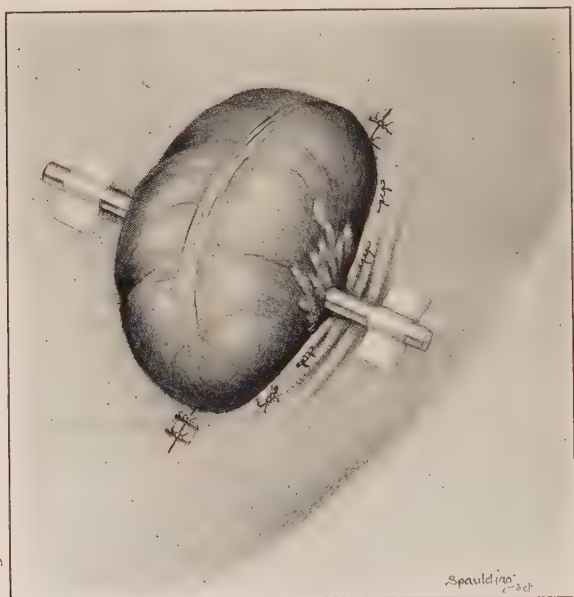


FIG. 70.—Gut supported on glass rod and sutured in position.

abdominal incision, separating the muscles rather than incising them. Either a rectus or McBurney incision on the left side answers this purpose very well. The opening should be no larger than is necessary to admit the index finger to secure a loop of colon which when pulled out of the abdomen should completely fill the incision. Having the opening small, a certain amount of muscular control is supplied to the



colostomy. This method of performing the colostomy does not permit of exploring the abdomen. If an exploration is necessary, a mid-line incision should be made as well.

One method of creating a spur is to pass a glass rod through the mesentery, fastening it in place with adhesive plaster. The glass rod may be retained for two weeks, or even longer

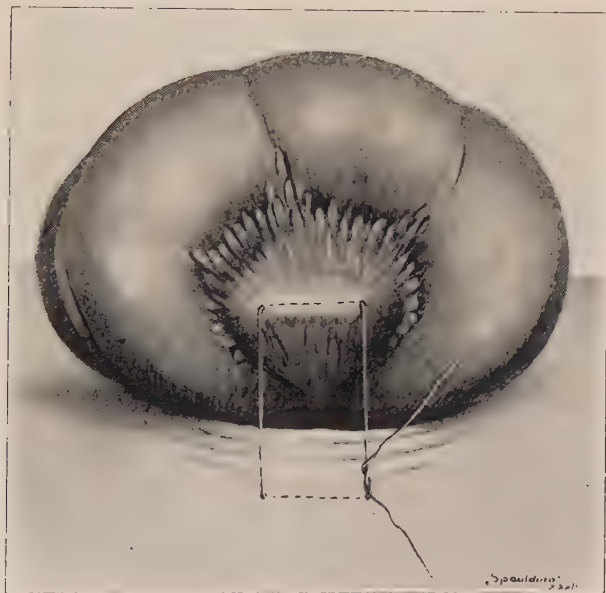


FIG. 71.—Anchoring the colostomy spur with braided silk suture.

(Fig. 70). I prefer the method practised by the late Mr. Goodsall of London (Fig. 71). An inefficient spur renders the operation useless by allowing feces to pass through it and irritate the growth below. The success of the operation depends on the method of anchoring the loop of bowel and is as follows: a No. 16 braided silk ligature threaded on a needle is first passed through the mesentery of the protruding

loop so as to include the whole width of the mesentery, and then through the skin about 1 inch from the abdominal incision and firmly tied (Fig. 71). This securely retains the spur well out of the wound and at the same time produces complete edema of the loop of bowel used for the colostomy by strangulation of its blood supply. The incision having

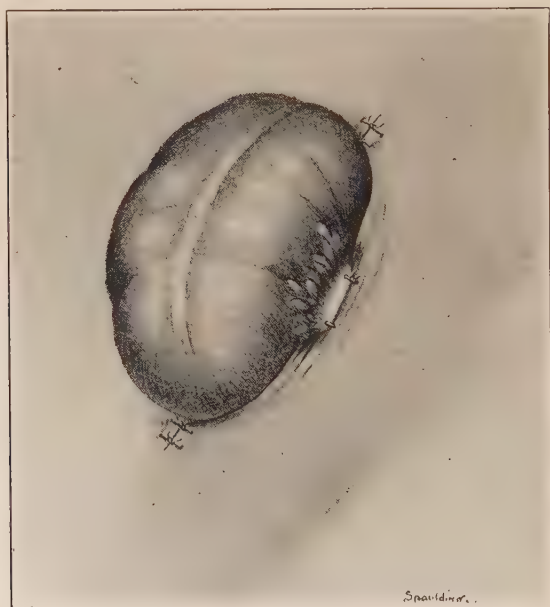


FIG. 72.—Silk suture tied. Spur held well out of wound.

been a small one, it is impossible for the spur to recede within the abdomen. The parietal peritoneum may be sutured to the bowel in three or four places with interrupted catgut, though this is unnecessary in most instances when the abdominal incision is small. Silkworm gut sutures are used to close the extremities of the skin incision. Provided

the obstructive symptoms previous to operation were not pronounced, the bowel is opened on the second or third day. If the patient is very uncomfortable from gas, a small incision should be made at once. After six or seven hours it is always safe to make a small incision into the spur. A week after the operation daily irrigation of the oral bowel with normal saline solution should be started. This will keep the parts clean and allay the ulceration present about the growth.

There have been many colostomy pads devised for use after this operation. They are, perhaps, responsible for much of the dread of a colostomy. It has been my experience that they irritate the spur and increase peristalsis as well. A small gauze pad smeared with vaseline and held in place by an abdominal binder I have found to be the most satisfactory for the protection and comfort of the patient.

Of late, radium has been employed in these inoperable cases of cancer of the rectum. Some reports have been very favorable and others not as good. In my opinion, it should never be employed without previously performing a colostomy, as the reaction set up by its administration has been so severe as to cause untold suffering. After a colostomy, it is perfectly safe and well worth trying.

## CHAPTER XV.

# RADICAL OPERATION FOR CANCER OF THE RECTUM.<sup>1</sup>

BY ROBERT C. COFFEY, M.D., F.A.C.S.  
PORTLAND, OREGON

COMPLETENESS is the most important desideratum connected with a surgical operation for cancer. Considered biologically, from the standpoint of the mere eradication of the cancer itself, completeness is the ideal to be sought. Considered broadly in the interest of the patient, this ideal must sometimes be modified. For instance, the Wertheim operation for cancer of the uterus is ideal from the standpoint of removing the cancer, but it is the opinion of a great many very competent surgeons that the increased mortality following this radical or ideal procedure more than outweighs the increased number of permanent cures. In other words, it is the opinion of most surgeons that a modified operation is advisable as a general rule, in that the modified operation in a thousand given cases of carcinoma of the uterus will probably add a greater total of comfortable days of life than would be observed in a thousand patients treated by the more ideal method of Wertheim. The complete block dissection for cancer of the neck, including the removal of all the vital tissues, such as the carotid artery, jugular vein, and even the pneumogastric nerve, is ideal from the standpoint

<sup>1</sup> This chapter appeared in *Surgery, Gynecology and Obstetrics* in June, 1924, under the title *Principles of Operation for Carcinoma of the Rectum*. Since then I have made no changes of importance in the technic of the operation.

of removal of the cancer but we are always called upon to decide whether it is ideal from the standpoint of the patient. The same is true of cancer of the lower jaw or base of the tongue, for which a surgeon, by a series of daring surgical maneuvers, removes these organs.

Some surgeons in operating for cancer of the uterus use the cautery and attack the most inoperable cancers, well knowing that more than likely both the rectum and bladder will be opened in the procedure if the operation is to be thorough. They seemingly disregard the other organs on the ground—as I once heard a surgeon say: “We are dealing with cancer.” We must remember also that we are dealing with a patient—a human being.

Cancer of the rectum has in the past been placed in this same category of borderline operability. The old Kraske one-stage operation, giving a mortality of 25 per cent or more with no control and no means of taking care of the fecal contents, was a most formidable affair. Who would want to be operated upon under such circumstances? Quite a few no doubt, but many of those choosing the operation would doubtless be quietly hoping to belong to that more fortunate 25 per cent or more of fatalities. It is this most terrible and mutilating of operations that has caused surgeons from time to time to try more conservative procedures by which the sphincter muscle could be preserved. Unfortunately the growth returns, the patient has very poor control at best; and nearly all surgeons have abandoned the effort to preserve the sphincter apparatus at the lower end of the rectum; for with a properly made colostomy in which the intestine is brought out through the left rectus muscle, the patient is by no means uncomfortable. Some such apparatus as the Delatour bag effectually serves as a reservoir to store the bowel contents. With this point settled, we are

free to do a complete operation for cancer of the rectum. By completeness, we mean complete devascularization and removal of the involved and contiguous area. By devascularization, we mean the cutting off of both the blood supply and the lymphatic and venous return circulation.

Contrary to the established belief, there are few parts of the body so favorably situated as the rectum for complete devascularization and removal of all the involved tissues in case of cancerous invasion. Most of the blood supply for the ampulla of the rectum and the recto-sigmoid, as well as that of the connective tissue and fat found in the hollow of the sacrum, comes through one vessel—the superior hemorrhoidal artery. Most of the return circulation goes back through corresponding veins and these vessels are accompanied by the lymphatics, which together serve as almost the sole avenue for the spread of the disease upward. These vessels may all be included in a single ligature placed opposite or just below their crossing of the promontory of the sacrum in the mesosigmoid. It will be seen by the composite colored plate (Fig. 79) that this ligature at once severs the blood supply and venous and lymphatic return circulation, thereby removing the danger of hemorrhage as well as upward metastasis during the further progress of the operation.

The article of Mr. W. E. Miles, which appeared in the *British Medical Journal*,<sup>1</sup> and was abstracted in the *International Abstract of Surgery*,<sup>2</sup> gives a very lucid description of the lymphatic circulation and also a very clear description of the method of the spread of cancer of the rectum as follows:

“Operation undertaken for cure of cancer must be based on the pathological findings and the field of operation must

<sup>1</sup> 1920, ii, page 730.

<sup>2</sup> 1921, 32, 280.



embrace all tissues apt to become invaded. The question of operation therefore necessitates a knowledge of the method in which cancer of the rectum spreads and the paths it takes. The early stage of adenocarcinoma of the rectum is confined to the mucous membrane and submucous tissue. It is sessile and readily movable upon the subjacent muscular coat, gradually increases in size and spreads in three distinct ways:

"1. By direct extension through continuity of tissue.

"2. Through the venous system.

"3. By means of the lymphatic system.

*"Spread of Growth by Direct Extension Through Continuity of Tissue.*—Although the tumor is freely movable at first, it soon becomes adherent. Extension takes place in all directions, but more in the transverse than in the longitudinal axis of the bowel. Adherence begins at the center or the oldest part of the tumor, but surface extension may progress more rapidly in one direction than another, thus fixing the indurated portion nearer one lateral margin than the other. It is difficult to determine how long a growth has been the present. From observations of tumors in ampulla of the rectum, however, it may be inferred that by the time three-quarters of the circumference of the bowel is involved the growth is more than one year old. While the growth is extending around the circumference of the bowel, infiltration of the muscular coat is taking place. This penetration continues until it is arrested for a time by the lymph sinus between the outer surface of the bowel and the surrounding fatty tissue. The growth finally extends across this space and involves the perirectal fatty tissue and the fascia propria of the rectum. Penetrated fixation to the sacrum, prostate, bladder, uterus, or vagina is impossible until the fascia propria has been involved. This would not occur, therefore, until a year after the earliest symptoms indicating the pres-

ence of the growth. Direct extension of carcinoma of the rectum is comparatively slow, and invasion of the surrounding tissues does not take place until the greater part of the circumference of the bowel has become involved.

*"Spread of Growth by the Venous System.*—Microscopic specimens afford evidence of direct invasion of venous radicals. It is, therefore, easy to understand how even in an early stage cancer cells may be detached and carried to a great distance from the primary growth, especially to the liver. Fortunately, this mode of spread is rare, and definite liver metastases are generally a late manifestation.

*"Spread of Growth by the Lymphatic System.*—The most important route by which cancer cells are disseminated is through the lymphatic channels. In the rectum there are two distinct sets of lymphatic channels by means of which such spread takes place: *i. e.*, the intramural and the extramural lymphatic systems. Dissemination in the intramural system is of very limited extent. The general scheme of the extramural lymphatic channels is represented in Fig. 79, *c*. The various tissues traversed by these vessels are vulnerable to metastatic deposits. Corresponding to the three lymphatic areas there are three zones of spread: (1) The zone of downward spread, which includes the perianal skin, the ischio-rectal fat, and the external sphincter muscle; (2) the zone of lateral spread, which embraces the levatores ani muscles, the retrorectal lymph glands, the internal iliac glands, the base of the bladder, and the vesiculæ seminales, and, in the female, the posterior wall of the vagina, the cervix uteri, and the base of the broad ligament with Poirier's gland; (3) the zone of upward spread, which includes the pelvic peritoneum, the pelvic mesocolon in its entirety, the paracolic lymph glands, and the group of lymph glands at the bifurcation of the left common iliac artery."

The author concludes that early growth in cancer of the rectum may metastasize widely into these zones and cannot be detected by ordinary rectal examination. He says: "The peritoneum, especially that portion which lies on either side of the parietal attachment of the pelvic mesocolon, is very often the seat of growth. Deposits, no doubt, begin in the subperitoneal lymphatic plexus, and the small intestine coming into contact with an exposed plaque, may become

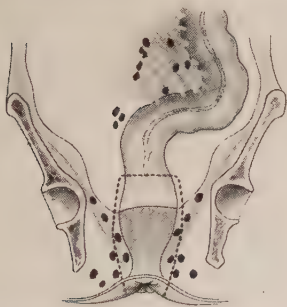


FIG. 73

FIG. 73.—Diagram showing the restricted nature of Kraske's operation. The rectum is merely dissected out as a tube containing a cancer, and the vulnerable tissues of the upward, lateral, and downward zones of spread are left. (Miles.)



FIG. 74

FIG. 74.—Diagram showing the first step in the evolution of the radical operation. The perianal skin and the ischio-rectal fat were widely removed as these tissues have been found vulnerable to recurrence. (Miles.)

infected and cause widespread dissemination. The pelvic mesocolon is also very frequently the seat of metastatic deposits even in early cases. Lastly, the paracolic glands may become the seat of metastasis. Cancer cells do not spread according to the anatomical lymphatic distribution but according to laws of their own. Thus metastasis may occur in any or all of these zones irrespective of the position of the primary growth.

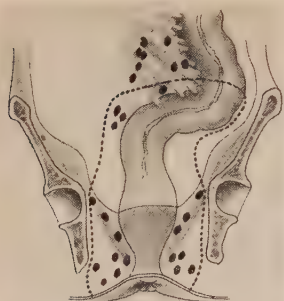


FIG. 75

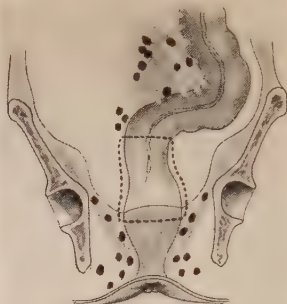


FIG. 76

FIG. 75.—Diagram showing the extension of the operative field as a further step in the evolution of the radical operation. In addition to the perianal skin and the ischio-rectal fat, all of the levatores ani muscles and the lower part of the pelvic mesocolon were included as these tissues were found to be highly vulnerable. (Miles.)

FIG. 76.—Diagram showing the limited character of the removal in perineal resection and vaginal resection. (Miles.)

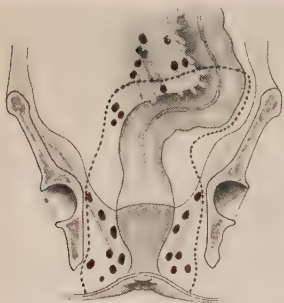


FIG. 77

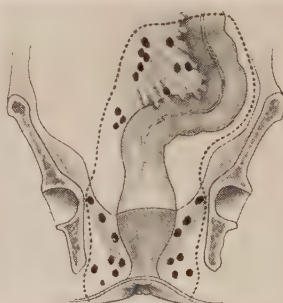


FIG. 78.

FIG. 77.—Diagram showing how much of the vulnerable tissues of the three zones of spread is left behind by the abdomino-anal operation. Even when the proximal end of the colon is brought down to the anus, the vulnerable tissues of the lower zone are left. (Miles.)

FIG. 78.—Diagram showing the final stage in the evolution of the radical operation. Whereas the vulnerable tissues in the lateral and downward zones of spread may be removed completely by an operation carried out from the perineum alone, the greater part of these contained in the upper zone remain out of reach. These tissues, which correspond to the axilla in the breast operation, can be removed only by the radical abdomino-perineal method. (Miles.)

"Cancer of the rectum, regardless of its position, is apt to spread to the tissues of the three zones described. The most vulnerable of these are the ischio-rectal fat, the levatores ani muscles, the retrorectal glands, and the pelvic mesocolon. Therefore, these tissues must be freely removed in an operation for cancer of the rectum."

Fig. 73 was taken from Miles' article and has been redrawn for the purpose of making more graphic the important lines. These figures show the relative thoroughness of the various operations which have been done in the past and Fig. 78, represents the ideals of thoroughness to be sought after. Figs. 73-78 with Fig. 79, which represents a composite picture of the important vessels to be noted in the operation for cancer of the rectum, together with the succeeding pictures in this article, will give the reader a graphic view of the enormity of the operation for removal of cancer of the rectum.

Up to this point, we are prepared to say that in the first place, it is possible to provide an artificial anus that permits a relatively comfortable continuation of life, thus disposing of one of the drawbacks of the original Kraske operation. Second, its anatomical relations to other organs, and the arrangement of its vascular and lymphatic supply makes it possible to remove a cancer of the rectum more completely and radically than almost any other cancer connected with the body. To undergo this radical operation is a tremendous strain on the vitality of the patient, for, as will be seen by these first two illustrations taken with those describing the technic for performing it, the abdomen must be opened and explored, the lower pelvic colon must be removed with all the fat of its mesentery and the fat found back of the rectum in the hollow of the sacrum and in the ischio-rectal space, all the levator and sphincter ani muscles and in front all the connective tissue up to the vagina in the female, and the



bladder, prostate, and urethra in the male. There is much sewing to be done in this operation which requires a great deal of time. In short, the radical operation for cancer of the rectum is one of the largest in surgery.

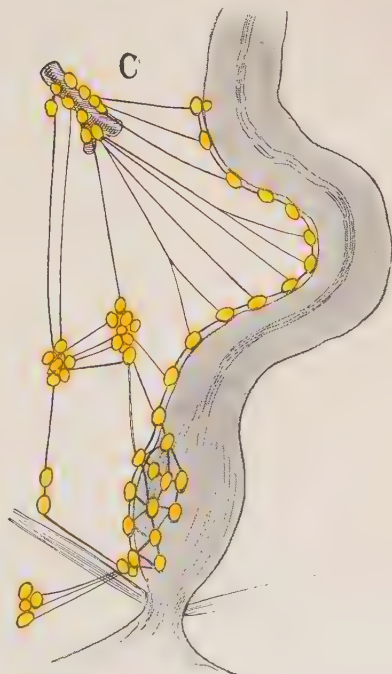
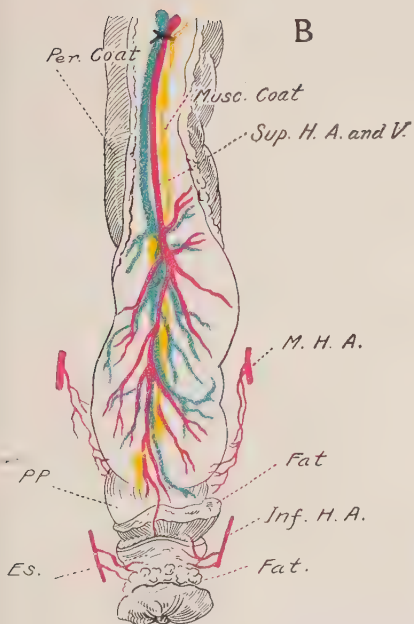
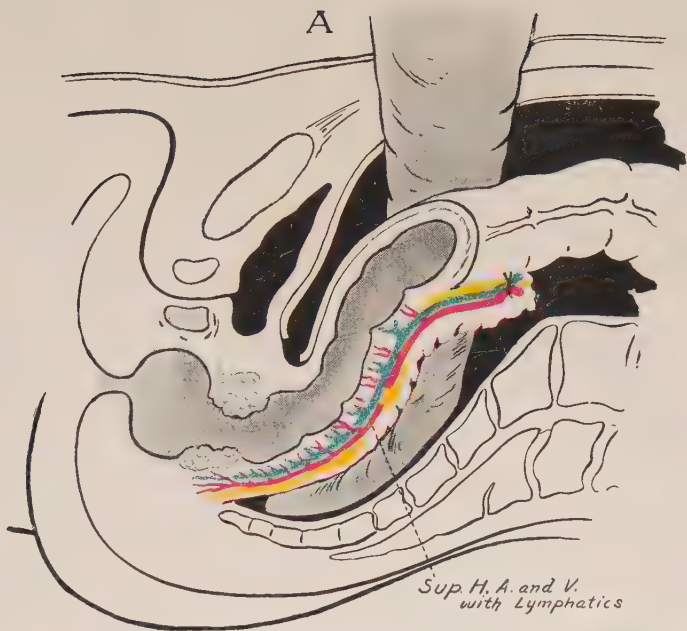
While it is true that some prefer the one-stage operation, I am very sure that the average operator, equally skilled in doing both the one-stage and two-stage operation, will obtain better results with the two-stage. While some individual patients have reparative material sufficient to make repair and at the same time keep up defense against infection throughout all the area involved in this operation, a large percentage of patients cannot put up the necessary defense all at one time. In attempting to do several operations in different parts of the body at the same operative session, I have frequently noticed a break-down of the defensive even to a point at which a clean abdominal incision would fail to unite. Therefore, it seems conservative and wise in very large operations to give Nature all of her defensive forces with which to produce an unbroken physiological mechanism before the entire burden of repair is thrown upon her. And after the principal avenues of extension have been severed or devitalized, we can then safely give the natural forces time to make the necessary repair for a complete and physiological mechanism before the final stage of the operation is to be done. In the early part of my work I attempted to do the second operation too soon, say within four or five days after the first, and was often disappointed by the breaking down

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DESCRIPTION OF FIG. 79.

*a*, Complete devascularization from above is possible by ligation of the superior hemorrhoidal vessels at the promontory of the sacrum. Note arteries, veins and lymphatics. *b*, Direct view of superior hemorrhoidal vessels and lymphatics which occupy the retrorectal space. The ligation of these vessels devascularize the ampulla of the rectum and rectosigmoid. *c*, Elaboration of Miles' picture showing the lymphatics of the rectum.







of an uninfected abdominal incision or the giving way of the peritoneal surfaces as sutured. I therefore venture the dogmatic assumption that in order to get the best results, it is necessary to do this operation in two stages, for I contend that the extent of the operative procedures cannot be greatly abridged if we are to obtain the best permanent results. It is further interesting to note that no more radical operation can possibly be done if we are to have proper regard for the interest of our patient, for in line with the statement at the beginning of the article, any growth which involves other vital organs in the pelvis, such as the bladder, ureters, or the sacrum, should be considered inoperable when taken from the standpoint of the patient and should be treated by palliative measures.

Up to this point, I think we may reasonably assume: (1) That we can comfortably dispense with the organ involved; (2) the involved organ is so situated, constructed, supplied, and drained that it may be removed without seriously involving other organs; (3) it can more safely be thus radically removed by utilizing the two-stage principle.

We are now confronted with the question: What two-stage method will assure a complete operation with the least drain on the vital forces of the patient with a resultant minimum mortality? It is not the purpose to discuss the relative value of the work of the great men who have led the way and shown us the possibilities in this field of surgery except in so far as it immediately concerns the principles under discussion. Suffice it to say that in all my early work I faithfully attempted to follow the work of Drs. W. J. and C. H. Mayo, whose work constituted largely a coördination and clinicalization of the best methods of European and American surgeons with their own original work and I think it will be generally conceded that certainly

no better work has been done than that at Rochester. It was only about ten years ago that I began to change my methods from the established methods used there. In the meantime, a number of other men, such as Lockhart-Mummery, Miles, Jones of Boston, and others were also varying the established technic. I shall not discuss the relative merits of these various procedures but rather the principles involved in the whole subject as indicated in the title.

As has been said, the lowest mortality with the old one-stage Kraske operation was, as far as I know, achieved by the Mayos and was about 25 per cent. The first great drop in the mortality rate was when the two-stage principle was adopted. In this operation a simple colostomy was made. A few days later the last segment of the sacrum with the coccyx was removed and the radical operation performed. I did most of my work by this method for several years but I am sure it is not possible, certainly not for me, to do anything like as complete operation by this method as by the one we are now using. Furthermore, as far as I know when this method was in vogue, no one was able to bring the operative mortality below 12 or 15 per cent. I appreciate that the operative mortality would vary to a great extent according to the completeness of the operation, but I think the degree of completeness can be definitely standardized as to the amount of tissue removed and also as to operability and inoperability by the very definite lines we have already suggested, and which Miles has so accurately diagramed.

The first question the operator has to decide is. What part of the operation is to be done at the first stage and what at the second? My belief is that the best results are obtained when the following principles are adopted for the first stage:

1. A completed physiological abdominal mechanism must be provided which is not to be disturbed afterward.

2. Complete devascularization of the involved and adjacent tissues from above. At the same time the devitalized structures must be mobilized and pushed down within easy reach of a sacral or perineal incision.

3. Separation of the retained physiological area from the discarded area by a quarantine pack which also serves the purpose of draining away the débris of any sloughing tissue resulting from devascularization.

The first two principles were adopted in 1914 and published in the *Annals of Surgery*, April, 1915. The complete devascularization was followed by a sloughing of the devascularized tissue which first developed a large abscess and later broke into the rectum. While the patients lived through this septic period, it was anything but an ideal condition and a means for draining away the débris of the sloughing tissue became imperative if these principles were to be utilized. This was found very easy in the female by putting a drain into the hollow of the sacrum through an opening in the posterior fornix of the vagina, but in man it was necessary to drain at the lower end of the abdominal incision up through the peritoneal cavity. This was anything but ideal as it completely upset the idealism of the second stage in that the physiological mechanism of the abdomen was broken by having this drain in the peritoneal cavity. But it was soon found that the peritoneum of the narrow pelvis of a man was easily adapted to the formation of a peritoneal encasement with which to surround the drain. Simple rubber tube drainage was soon displaced by a larger protected pack of gauze wicks which served the purpose of separating the physiological from the pathological area and also provided efficient drainage. This third point made the bond which satisfied our idealism. This was described first in *International Clinics*.<sup>1</sup> Up to this time these three principles

<sup>1</sup> 1921, vol. 4, series 37.

had been used only in those cases where the growth was located in the ampulla of the rectum proper or lower down and in which the lumen in the growth was sufficiently large to permit the passage of a good-sized rectal tube for the purpose of inverting the sigmoid and drawing it down through the growth and through the anus. This procedure was not applicable in a considerable number of cancers located at that very difficult point the recto-sigmoid junction, because of the fact that cancers so located produce early obstruction.

Soon after the publication of this article, another advance step in technic was made so as to include this class of cases, which consists of separating the rectum and perirectal tissues from the sacrum and coccyx in the back and from the bladder and prostate in front. After doubly clamping the intestine well below the growth, the intestine was severed between the clamps, leaving the lower clamp on the stub of the rectum and removing the growth with all the intestine and devitalized fatty tissue above. The lower clamp was allowed to on the distal end of the rectum and its long handle brought through the peritoneal encasement along with the drain or quarantine pack. This additional technic was presented before the American Medical Association in 1922, and published in *Annals of Surgery*, October, 1922.

Having proved the practicability of this step, it was easy to apply it to the only remaining class to which these principles had not been applied, namely, a low growth the caliber of which was not sufficiently large to permit of the passage of a rectal tube upward for the purpose of invaginating and bringing down the upper end of the sigmoid through the anus. In this class of cases, the steps of the operation are the same as the one just described, except that the part of the gut above the growth is doubly clamped and severed



between the clamps, the intestine included in the upper clamp along with all the fat in the hollow of the sacrum is removed at the first operation while the lower clamp is brought out through the drainage tract along with the quarantine pack or a ligature may be tied around the stump of the intestine in place of the clamp. The growth remains until the second operation.

With the successful adaptation of these three fundamental principles to all these classes of cases, they become universal in all cases of operable cancer of the rectum, and this universal adaptability, we feel, justifies us in saying that we are dealing with principles rather than technic. As my experience has grown, I have gradually extended the amount of work done at the primary operation until it has become necessary to make a slight change in nearly all the illustrations dealing with technic.

There are three types or degrees of cancer of the rectum which require variation in technic in carrying out the three fundamental principles set forth. The most frequent cancer encountered in a routine clinic is a cancer located in the ampulla of the rectum which has not yet produced anything like a total obstruction. The second most frequent is cancer of the recto-sigmoid in which obstruction is one of the earliest symptoms. The third in frequency is an extensive cancer located in or below the ampulla in which obstruction is marked but in which the growth is still removable. There is also a difference in the application of the third principle in man and in woman for obvious anatomical reasons. The first description of technic will, in order of importance, be that for an unobstructing cancer located in the ampulla of the rectum of a man inasmuch as cancer of the rectum is much more frequent in men than in women. This for con-

venience will be referred to later as the "standard operation," inasmuch as it includes the three essential principles.

The first step in the technic of the standard operation is common to all cancers of the rectum.

1. Make a long right rectus incision about 1 inch to the right of the median line extending slightly above the umbilicus. Through this incision, a search is carefully made for metastatic growths in the liver and in the mesentery and retroperitoneal glands. The growth itself is carefully examined through the abdominal incision. If a metastatic growth is discovered in the liver or in the retroperitoneal space, it goes without saying that the plan for the radical removal of the rectum should be abandoned for palliative measures; likewise, if the growth involves the bladder or the firm pelvic wall. This long incision serves the purpose for exploration and for the manipulations of the operation. It is made on the right side because the permanent colostomy is to be made on the left side. It is always best to make a colostomy wound through a separate stab wound. By having the large operating incision on the right side and the colostomy on the left side, it is possible to protect the large clean wound from the infection of the colostomy.

Having decided to do the radical operation, the intestines are packed well up into the upper abdomen with moist gauze, the exception being the sigmoid which is brought entirely below the wall of gauze. With the left hand, the loop of the sigmoid is lifted high up, the peritoneum of the mesentery is cut down by insinuating the blade of a pair of blunt scissors beneath the peritoneum but external to the vessels. This incision goes down into the pelvis around in front of the rectum, at some distance from it, clipping the recto-vesical fold near the bladder. Special angle scissors are made with long handles and a blunt or probe point on the

lower blade (Fig. 80). The left forefinger is now inserted through the mesentery where the peritoneum has been cut and with the ends of the forefinger and thumb directed backward toward the promontory of the sacrum, and



FIG. 80.—The sigmoid is mobilized by cutting the peritoneum on each side of its mesentery. Dotted line indicates incision of peritoneum of cul-de-sac around rectum and between bladder and rectum with long handle angle scissors.

brought together, the superior hemorrhoidal artery is felt about  $\frac{3}{4}$  inch in front of the bone. Its pulsation is about as strong as the radial artery. A large ligature, usually a double chromic catgut suture, No. 2 size, is passed beneath the artery with a long curved ligature carrier, the

loop of thread is picked up on the opposite side and brought through the mesentery and around the large vessel and tied very tightly in order to squeeze out the fat in the mesentery. A similar ligature is placed 1 inch lower down. The mesentery, including the artery and vein, is now severed between the two ligatures. The sigmoid arteries coming from above

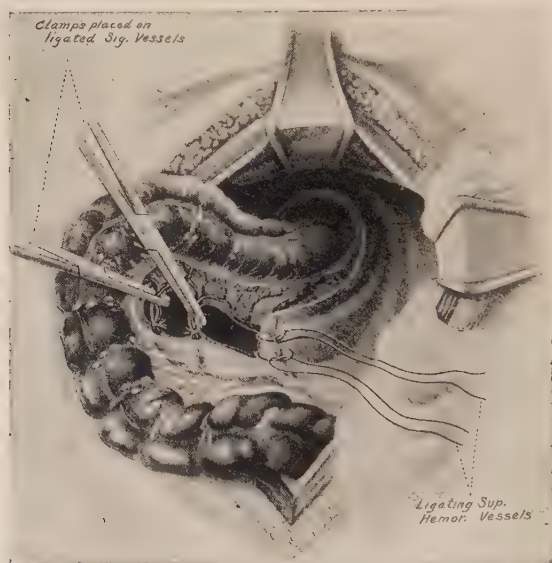


FIG. 81.—Two ligatures placed around the superior hemorrhoidal vessels about 1 inch apart. The sigmoid arteries tied on one side and clamped on the other.

are grasped in forceps and ligated so as completely to cut off the circulation from this source (Fig. 81). The fingers of the left hand are then insinuated between the ends of the severed superior mesenteric artery and also between the cut edges of the mesentery and pushed downward along the hollow of the sacrum, thus stripping off all the fat and

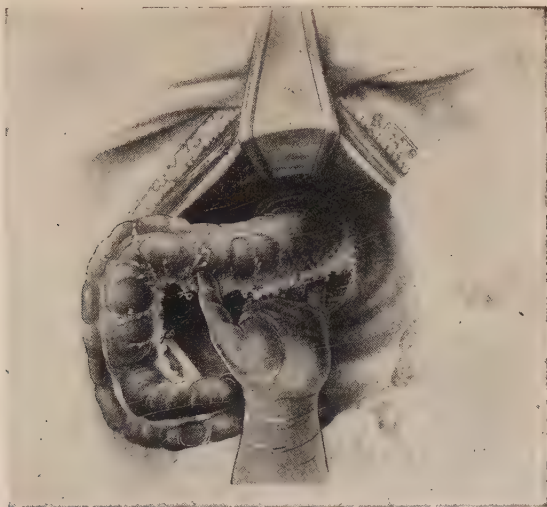


FIG. 82.—The fingers of the left hand, insinuated between the severed ends of the superior hemorrhoidal vessels and between the cut peritoneal edges of the mesosigmoid, are lifting the fat from the hollow of the sacrum down to the coccyx.

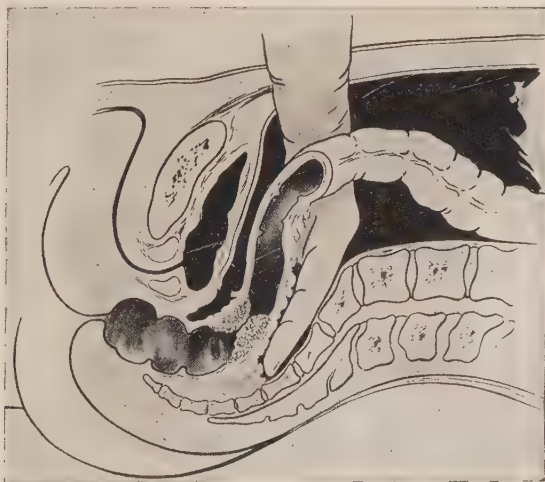


FIG. 83.—Sectional view of Fig. 82.



connective tissue down to the tip of the coccyx (Figs. 82 and 83). If there is any return bleeding in the cut mesentery from below, this is stopped by grasping with forceps. After this separation, a large temporary gauze pack is placed in the hollow of the sacrum back of the rectum while the second major step of the operation is performed.

Before beginning this second step, we carefully determine the vitality of the circulation in the upper sigmoid which is to be used for permanent colostomy. It is very important to have a good circulation. This having been determined, an incision about 1.5 inches to the left of the median line and about 2 inches below the umbilicus, 1.5 or 2 inches in length, is made down through the left rectus muscle. A large Payr clamp is inserted through this incision, passed across within the abdomen to the main incision, where it grasps the proximal sigmoid at a point where it has been determined the circulation is good. Another clamp is placed just below, except that this clamp is in the main wound. The intestine is then severed with the cautery which is made to heat the blades of the clamp and thus sterilize it before it is drawn out through the wound (Fig. 84). It is pulled well up through the wound with the clamps where it is sutured to the layers of the abdominal wall, with fine double chromic catgut placed as a lock stitch, first sewing the peritoneum to the bowel wall, then the aponeurosis and finally a few interrupted sutures hold the skin to the peritoneal surface of the bowel. Usually about 1 inch of the bowel remains outside the skin.

When this part of the operation is completed, a rectal tube which was introduced into the anus by a nurse at the beginning of the operation, is now pushed up through the sigmoid to the point near the clamp on the distal gut. A purse string of linen is placed around the gut below the



clamp, the clamp is removed, the end inverted. The tube is pushed up to the end of the gut, its eye is located, a round needle armed with four double, strong linen thread is passed through the wall of the intestine, through the eye of the rectal tube, out through the end of the rectal tube, through the



FIG. 84.—Clamping and cutting the sigmoid after the vessels have been ligated. Note that one of the clamps passes through the stab wound in the rectus muscle.

opposite wall of the intestine, is brought out and tied in a long loop fully 1 inch in length. The mesenteric fat on this distal gut is now trimmed off well down to the bottom of the pelvis, as much of the large sheet of fat which has been peeled off from the sacrum as possible may be ligated and removed. The artery forceps grasp the intestine on either side (Fig. 85), the nurse pulls on the tube, inverts the end of the gut down

to the holding forceps when the forceps are made to grasp further down on the intestine, then the gut is pulled all the way down and out through the anus, where it is held taut in inversion by a clamp placed on it on the outside or by a



FIG. 85.—Proximal sigmoid has been fastened to layers of abdominal wall and its end held closed with a clamp. Tube is passed up to end of distal sigmoid, where it is fastened by a strong double suture passed through the intestine and eyes of tube and tied. By pulling on the tube, the sigmoid is inverted and drawn out through the anus.

large safety pin. This loop of thread which attaches the rectal tube to the inverted end of the gut is made long so that the tube precedes the inverted end in going through the narrows of the growth.

The fourth step in technic is to close all raw surfaces and openings so as to reduce to the minimum the danger of adhesions or postoperative obstruction. This is done as follows: First, the abdominal lumen to the left of the emerging



FIG. 86.—After the space between the sigmoid and the left lateral parietal peritoneum has been closed by suture, a continuous catgut is run along the mesosigmoid covering the raw fat edges with peritoneum down to the narrow portion of the cul-de-sac, where drain is inserted.

sigmoid is closed by a double chromic catgut beginning in the lateral parietal peritoneum over the psoas muscle and with a continuous lock stitch bringing together the peritoneum of the front and back walls of this space over to

the emerging sigmoid to which it is sewed. These sutures should be drawn very taut and should leave no possible space for failure to unite. An extra reënforcement line of suture is often used. From this point, the continuous suture is carried on down, covering in the raw cut edge of the mesenteric fat to the brim of the pelvis (Fig. 86). At this point in the operation a large cigarette drain, which is to

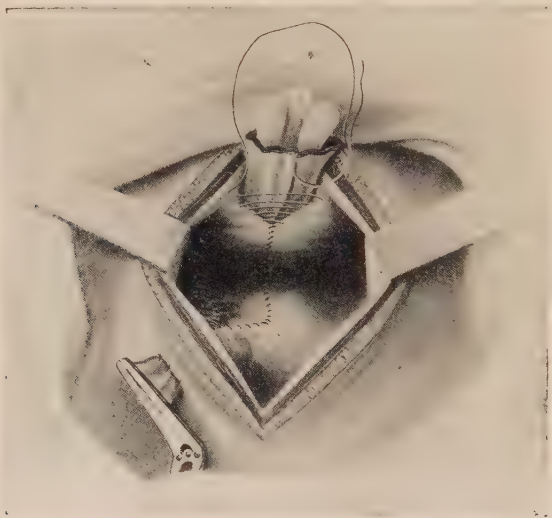


FIG. 87.—The suture line continues to bring the parietal peritoneum from the sides of the narrow pelvis around the drain until the abdominal incision is reached, making the drain extraperitoneal.

serve the purpose of both drainage and a separating quarantine, is placed with its end in the bottom of the pelvis in contact with the hollow of the sacrum or coccyx. The suture is now continued, widening its scope so as to bring in the peritoneum of the lateral walls of the pelvis snugly around the drain. This suture continues forward until the peritoneum is closed around the drain up to the lower end of the long abdominal incision (Fig. 87). Thus all the

raw surfaces and openings which would favor postoperative adhesions or postoperative obstruction have been closed, the devitalized tissue has been pushed down to the field of the second operation, and separated by an extraperitoneal quarantine which also takes the place of a drain (Fig. 88).

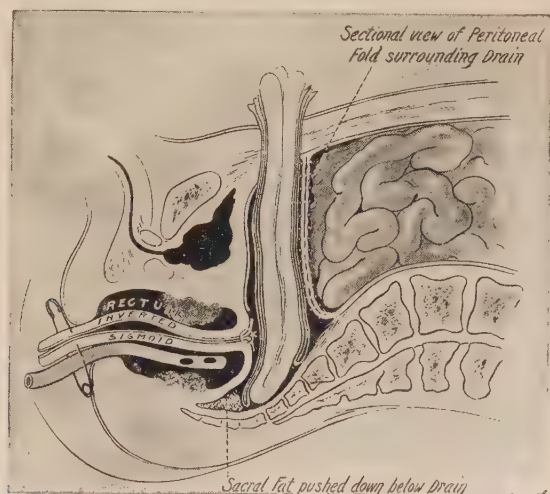


FIG. 88.—Sectional view of drains which have been tubularized by the peritoneum of the pelvic wall. Fat in hollow of sacrum is pushed down, a drainage tube in rectum and inverted sigmoid held down by a safety pin.

The question of passing a drain up through the rectum through a puncture in the vault of the rectum above the growth into the cavity containing the devitalized tissues, or inserting a drainage tube through the space between the rectum and the sacrum for the purpose of draining the devitalized area, was the first consideration, but experience caused me to decide in favor of the method described.

After the type of cancer with which we have just been dealing, the next most frequent and important cancer of the rectum is moderately advanced cancer located in the ampulla



of the rectum of woman. The operation in woman differs from the standard operation just described in two points:

1. When the time comes to place the quarantine, a long forceps is passed into the vagina, a hole is made in the posterior fornix through the septum into the cul-de-sac. Enough

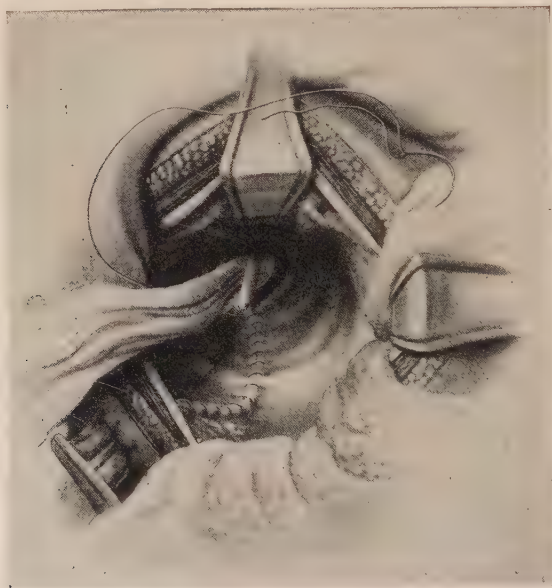


FIG. 89.—A large clamp has been passed through a stab wound in the posterior fornix of the vagina and is grasping a roll of gauze wicks which are to be drawn out through the vagina as a quarantine and drain.

wicks to make a roll of gauze 1 inch or more in diameter is put in the grasp of the forceps and drawn out through the vagina, leaving enough of the wicks inside the cul-de-sac to turn over the end of the inverted rectum into the hollow of the sacrum and coccyx where it is to form a quarantine, and is also to serve the purpose of a drain (Fig. 89). (As above stated, this same technic may be applied in the male



by bringing the pack or drain out through a stab wound back of the rectum and omitting the drain in front. An objection to this would be a cut both in front and back leaving the patient no comfortable surface on which to lie while no drawback to the technic has been noticed.)

2. The uterus may be turned backward into the hollow of the sacrum and sewed around to the parietal peritoneum

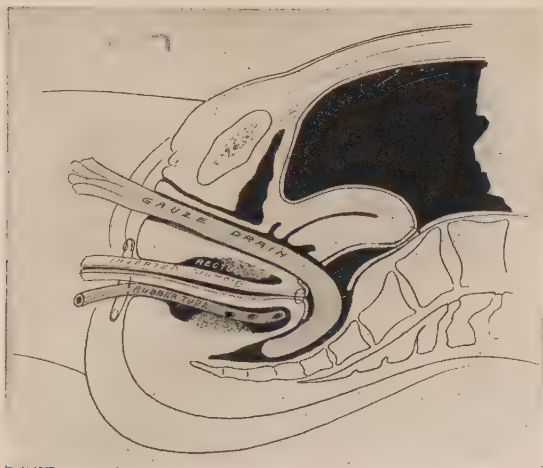


FIG. 90.—Sectional view of quarantine drain surrounding inverted end of growth and emerging from the vagina.

for the purpose of making a good abdominal floor and an intact peritoneal cavity (Fig. 90) or it is very easy to use the pelvic peritoneum back of the uterus.

The next cancer of the rectum of most importance is located in the recto-sigmoid segment of the gut, in which obstruction is one of the earliest symptoms and in which it is impossible to pass a tube for the inversion of the end of the distal sigmoid (Fig. 91). In this case, the steps of this operation are the same as have been related in the standard operation

except that the bladder and prostate are separated from the rectum in front (Fig. 92), and the rectum is mobilized on the



FIG. 91.—High rectal cancer producing stricture.

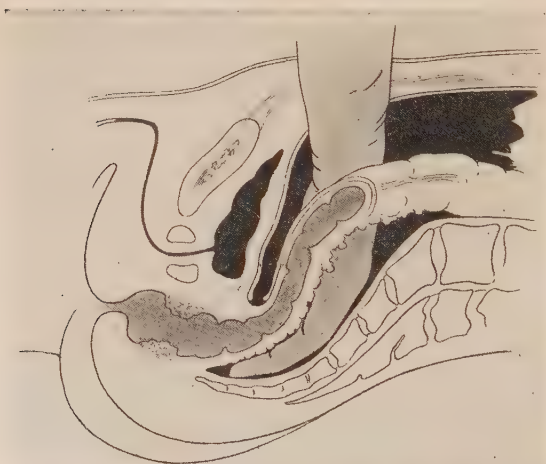


FIG. 92.—Sigmoid has been mobilized. Peritoneum around the rectum has been cut, the bladder separated from rectum down to the prostate. Fingers of left hand being insinuated between rectum and sacrum down to point of coccyx.

side as well, after which a long clamp grasps the rectum as far below the growth as possible. Another clamp is placed between this clamp and the growth, after which the intestine is cut between the two and the severed sigmoid is removed along with the growth and the devitalized fat which has been lifted when mobilizing the rectum (Fig. 93). The handle

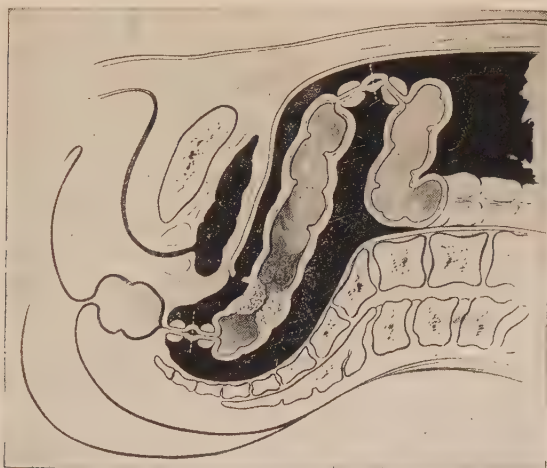


FIG. 93.—The freed bowel is doubly clamped above by Payr's clamp and severed. Below, it is doubly clamped by long-handled clamps and severed, after which intestine with growth is removed.

of the clamp on the remaining rectum is brought out through the lower end of the abdominal incision, the quarantine drain is placed in the same way and surrounded by the peritoneal encasement (Fig. 94), just as in the standard operation, while in woman the clamp and the drain would be brought out through the vagina.

The third type of cancer of the rectum, which is growing more infrequent as the knowledge of the disease is spread, is one in which the cancer is located in or below the ampulla,

does not involve the genito-urinary organs, but has a lumen which is so obstructed as to prevent the introduction of a large rectal tube. In this case, the preliminary steps are the same as in the standard operation described except that the intestine instead of being inverted is grasped and cut between clamps above the growth, the lower clamp next to the growth being brought out with the quarantine or replaced

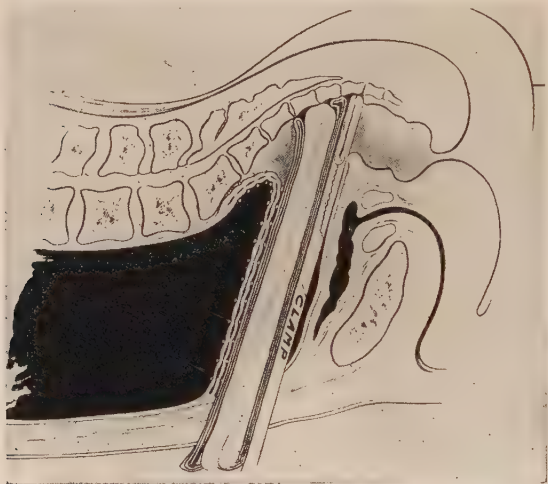


FIG. 94.—The handle of clamp holding stub of rectum is brought out through peritoneal tube with cigarette drain.

by a ligature (Fig. 95), the upper one being removed with the severed sigmoid and devitalized fat.

Having completed the vital parts of the operation, the large abdominal incision is closed, the Payr clamp on the protruding end of the sigmoid is removed and an Ochsner forceps applied to hold the intestine closed until it is desired to open it. The forceps is fastened to the abdomen by adhesive tape.

For the protection of the main wound from the contents of a colostomy when the gut is opened, I have for a long time used a collodion dressing which is put on as follows: The skin between the wound is thoroughly dried with pure alcohol followed by dry gauze. A layer of gauze, one thickness, about 8 inches by 4 inches, is laid over the main wound



FIG. 95.—Obstructing low cancer of the rectum. Devascularization and removal of sigmoid has been performed as in the standard operation. A clamp has been placed on the intestine above the growth and brought out with the quarantine drain.

with its edge on the skin between this wound and the colostomy wound. This edge is fastened to the skin for about 1 inch with collodion. A sheet of rubber tissue about the same size is laid over the gauze but not quite reaching the edge. Then another layer of gauze, the size of the first, is laid on top of the rubber tissue and its edge fastened to the edge of the first layer of gauze and the rubber tissue by more collo-

dion. Another layer of rubber tissue is laid on top of this collodion to prevent it sticking to the gauze dressings. A roll of gauze is then laid on top of this between the covered wound and the colostomy (Fig. 96). This dressing thoroughly protects the clean wound from the colostomy so that the wound should heal without breaking down.

The requirements of the three fundamental principles laid down for the first stage of the operation having been completed, the operation is halted until a complete anatomical

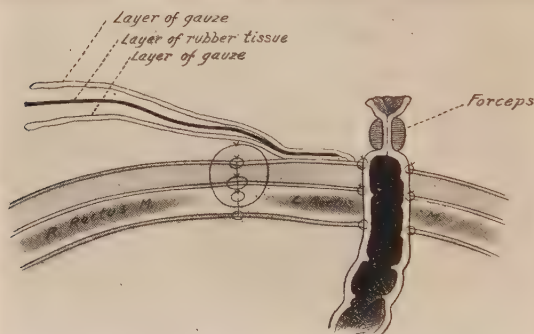


FIG. 96.—Cross-section of abdominal wall showing the collodion dressing and its relation to the wound and to the colostomy.

and physiological abdominal mechanism has been reëstablished. By this we mean that the sutured peritoneum above the quarantine has firmly healed, the abdominal wound has healed, the artificial anus is firmly established and acting well, the patient's pulse and temperature are practically normal and the patient's digestive apparatus is functioning normally. This is usually completed about the tenth day after the operation. Occasionally, we do the operation a little earlier but sometimes the second operation is delayed several days longer until the patient is in a good healthy



condition. In the meantime the enemy, the cancer, has been largely cut off from its support, is quarantined from the rest of the body to a large extent, and is almost harmless for the time being. The most startling and spectacular thing that takes place during this interval between operations, is the line of cleavage between the tissues which have been devitalized and are to be removed and the normal structures which are to remain. This change makes the second operation a minor affair.

When we are ready for the second operation, we still have in place the quarantine, especially in man for it is allowed to remain as a landmark in doing the second operation. In woman, where the retroverted uterus has been used to form the floor of the cavity, the pack may be removed from the vagina a few days before the second operation in order to get rid of the odor.

The patient, if a man, is placed on an operating table which breaks in the middle. He lies on his face with both head and feet lowered in the jack-knife position. Incision is made in the center of the lower part of the sacrum down to within an inch of the anus, where it divides and surrounds the anus and all the anal muscles; any bleeding skin vessels may be caught with forceps; the coccyx and lower end of the sacrum are exposed; the last joint of the sacrum and coccyx removed with bone forceps; the fingers of one hand are insinuated between the sacrum and the ischio-rectal fat until the cavity containing the quarantine is reached (Fig. 97). Usually there is a good deal of pus and débris in this cavity, which is entirely ignored as harmless. The fingers are then pushed over farther around the end of the inverted rectum and above the growth and the rectum, and all are peeled out with an ease and completeness which is not believable until one has actually had the experience (Fig. 98). The

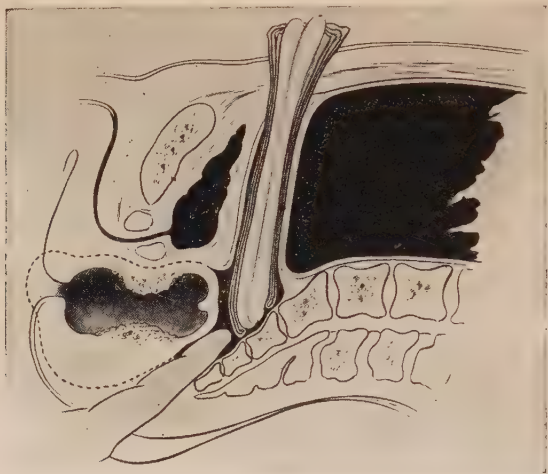


FIG. 97.—Coccyx and last joint of sacrum have been removed. Finger inserted into the cavity around the drain.

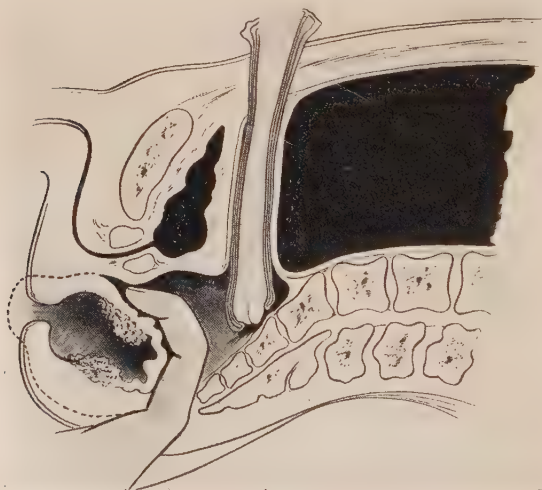


FIG. 98.—Fingers flexed on palm, separating rectum from bladder, prostate, and urethra.

usual time required for the whole operation from the time of the first incision in the skin until the specimen is entirely removed is about five minutes without any necessity for hurrying (Fig. 99).

In woman, we usually use the Murphy method and split the vaginal mucous membrane and perineum. If the growth



FIG. 99.—Space from which rectum has been removed, connected with abdominal drainage canal through which irrigation may be conveniently made.

is on the posterior wall of the rectum, the mucous membrane of the vagina is simply lifted and allowed to remain. If the growth is in the front wall of the rectum, the posterior wall of the vagina comes away with the rectum. After this incision in the vaginal wall is made, the fingers of the left hand are passed through the drainage opening, made to curve around the inverted rectum, follow down past the coccyx

and peel out the growth with the rectum and the muscles around the anus (Fig. 100), which are cut as far distal to the growth as possible. Without any hurry, this operation has been performed in less than five minutes. In no instance is there any bleeding, except that around the anus and anal muscles, which requires the use of artery forceps. I have several times found it unnecessary even to use these. I think

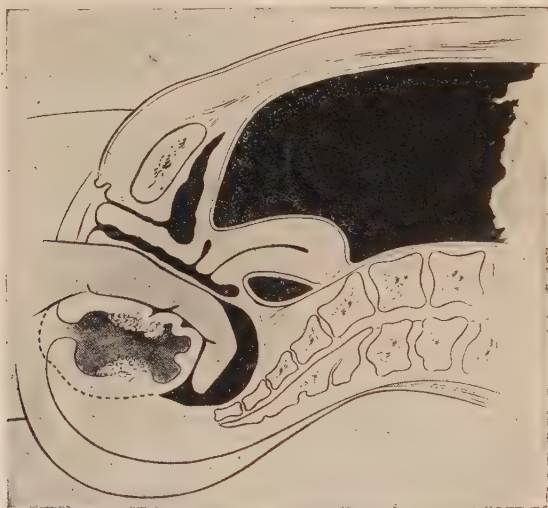


FIG. 100.—The vaginal wall has been split. Finger is passing around the end of inverted bowel enucleating the growth without removal of the coccyx.

I am safe in saying that the total loss of blood for both operations would not average more than 4 ounces and at no time are we in danger of any serious loss of blood. The clean cavity left after removal of the rectum in this way is very surprising. Nature for some reason has, during this interval, made a line of cleavage which is very definite and the fingers, without particular care will follow this line

of cleavage. After the rectum is out, the vesiculæ seminales, vas deferens, and bladder are in plain view, practically without bleeding. The cavity along the hollow of the sacrum is almost as smooth as the bone itself.

In case the cancer has been very extensive and has probably penetrated the fascia propria, we use a large dose of radium packed in the gauze. In some cases we have used the radium at the time of the operation and at other times we have used it four days later with a second pack of gauze. The radium is applied by using two or three 50 milligram tubes of radium in the ordinary brass containers, arranged in tandem and sewed to a roll of gauze. In packing the wound, about  $\frac{3}{4}$  inch of gauze is placed between the radium and the prostate and bladder before the gauze containing the radium is put in place. The gauze is then packed lightly on top of the radium which is allowed to remain twenty-four to thirty hours, depending upon the dose desired. Radium applied to a fresh wound in this way retards the healing at the external opening which we believe is an advantage, for no matter how large the opening on the outside, there is a tendency for it to heal ahead of the upper end of the cavity.

I have been asked: "If this second operation is so simple, why not do it at the first operation?" In answering this question, I may say in the first place that the operation performed without this interval of waiting is by no means so simple, for the lines of cleavage just described are not formed. The definiteness of the line of cleavage around the fascia propria of the rectum and the ease with which the second operation is performed is very amazing to anyone doing the operation for the first time or even observing its performance. The cause of this line of cleavage or edematous area is probably due to the complete shutting off of the cir-

culatation from above which very largely devascularizes the perirectal tissues inside the fascia propria at the first operation. This line of cleavage seems to be comparable to the line of demarcation in gangrene and occurs at the point at which the normal circulation outside the fascia propria encounters the devascularized area at the fascia propria. It does not occur in the absence of devascularization and



FIG. 101.—Photograph showing wound on eighteenth day after operation. Patient allowed to be up.

as far as I know it does not occur in the absence of drainage or the quarantine which of necessity follows devascularization. In the second place, the additional operation would almost double the amount of raw area to be repaired at the first operation and would, therefore, make a much heavier draft on the vital forces of the patient.

Formerly, we partially sewed up the perineal wound. This we have abandoned and now leave the wound entirely open. After the removal of the rectum, this immense cavity is packed with a large 5-yard gauze tape which is



allowed to remain about four days, when it is removed. The quarantine may be removed at the time of the second operation or when the big pack is removed. For purposes of cleanliness, irrigation in the case of man is made through the opening through which the drain was brought out (Fig. 99). The cases in which we have left the wound wide open have done better in the long run than those in which we have attempted to close the wound partially (Fig. 101). The patient may be up in a couple of weeks, the drainage is perfect and time is the only essential yet remaining.

During the past ten years in an experience of more than 100 cases of cancer of the rectum treated by all methods, I have operated on 47 patients by the method described with 2 deaths, the eighth and the thirty-second cases. I am not yet prepared to report on final results but from the unofficial reports I have received, I feel sure that the ultimate reports are going to be as good as I have received from any other cancer involving the abdominal viscera. I am certain that an individual afflicted with cancer of the rectum has many more chances of long life than has one afflicted with cancer of the stomach or with cancer of the uterus. I feel in connection with this subject that no operation can be more thorough than the one we have described and the low mortality so far shown is exceedingly gratifying. In short, cancer of the rectum, instead of being one of the most hopeless of cancers, must now be considered one of the most hopeful, and particularly if the doctors first seeing the case will examine the rectums of patients with the finger as routine when the complaints justify. The diagnosis can nearly always be made early enough to offer a good chance for a permanent cure.



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